VTS TRAINING AND QUALIFICATIONS, 2020 AND BEYOND

WORKSHOP REPORT

15 and 18 June 2020

Online Workshop

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Report of the workshop on VTS Training and Qualifications, 2020 and beyond

Executive Summary

The IALA Workshop on VTS Training and Qualifications, 2020 and beyond was held online on the 15 and 18 June 2020. 51 participants from 23 countries participated in the Workshop.

The primary objective of the workshop was to obtain first-hand information from those involved in VTS operations and training to enable the IALA VTS Committee to review and update the IALA V-103/1 VTS Operator Model Course by identifying the current needs of the profession and assessing the key competencies desired against the existing curriculums.

Five break-out groups were established to explore the key competencies of a VTS Operator and then to consider these against the current curriculum in the V-103/1 Model Course. Each breakout group was given a general question/theme to enable the discussions to be framed around one or more modules of the model course.

The output from the breakout groups which would be submitted to the IALA VTS Committee for further consideration. Additionally, participants were reminded the further input on the topic areas discussed would be welcome in the coming weeks.

The outcomes of each breakout group have been collated and are available at Annex A to the report.

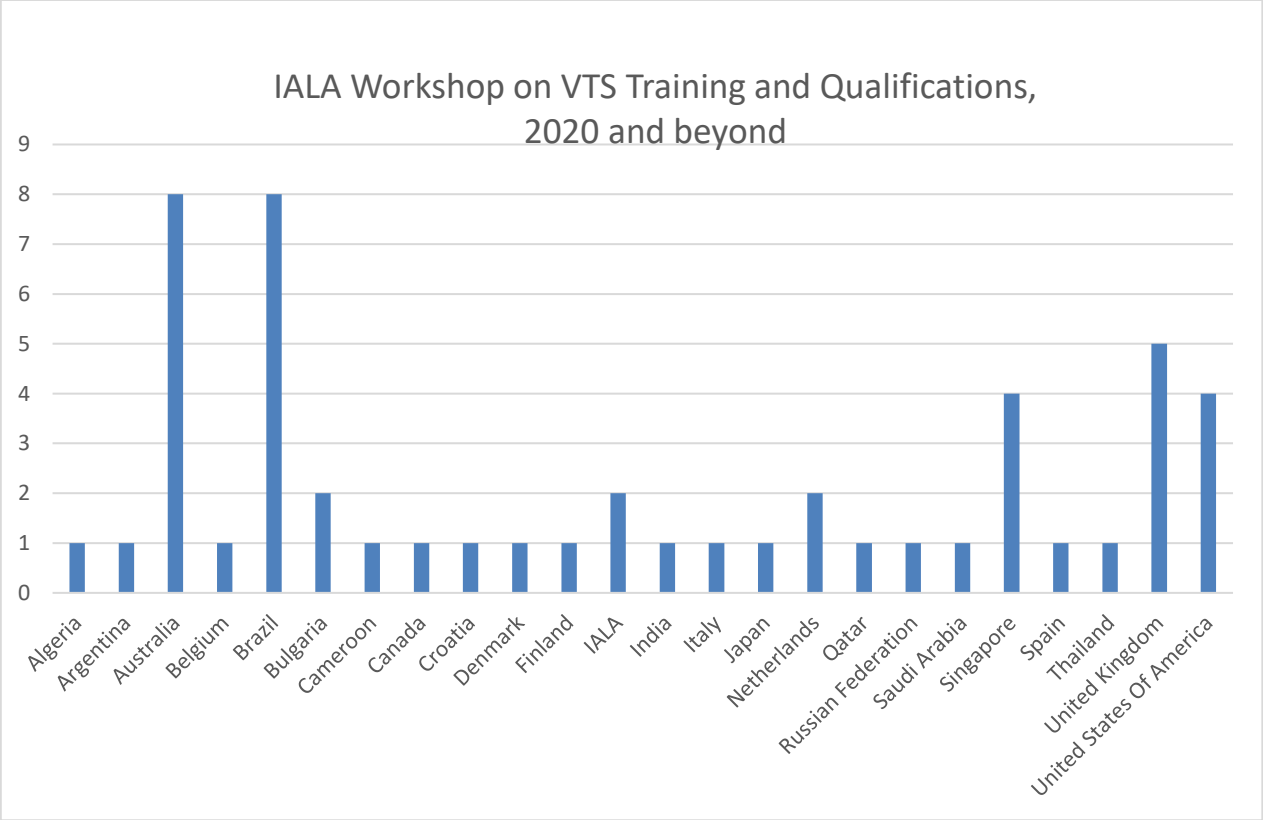
Contents

Report of the IALA Workshop on VTS Training and Qualifications, 2020 and beyond

1. INTRODUCTION

The IALA Workshop on VTS Training and Qualifications, 2020 and beyond was held online on the 15 and 18 June 2020.

51 participants from 23 countries participated in the Workshop. An analysis of the attendance is in graph format below:



1.1 Administrative announcements

Workshop participants were briefed as to how the online workshop would proceed. The following statements were included within the invitation to the workshop:

- IALA has a policy regarding compliance with the General Data Protection Regulations. IALA will include a list of participants in the report of this workshop. Any participant who wishes to remove their information from the participants list should advise the Secretary as soon as possible.
- If anyone has the knowledge of any patents, including pending Patents, held either by themselves or by other organisations or individuals, the use of which may be required to practice or implement the content of IALA documents being developed or worked on in this workshop then please advise the Secretary.

1.2 Welcome from the Dean of the IALA World-Wide Academy, Omar Frits Eriksson

It is a great pleasure for me to see so many participants here at this Workshop on VTS training and Qualifications.

This is actually the first large scale online event organized like this by IALA, and we are looking very much forward to learn from this event, how to best organize and run such events.

This workshop is being held under the auspices of the IALA World-Wide Academy and the IALA VTS Committee, and the primary objective is to obtain first-hand information from those really involved in VTS operations and VTS training, in order to enable the VTS Committee to review and update the IALA VTS Operator Model Course.

With your assistance, we hope to identify the current needs of the profession as well as any possible gaps in the current curriculum.

The decision to develop the IALA VTS training curriculum came about in mid-nineties of the last century and, at about the turn of the century, the first VTS model course was published. It was later revised, but now it is time to have another look at it.

Technology evolves constantly and the working environment of the VTS operator is constantly changing, becoming more and more complex with the increase in traffic volume and the composition of vessel traffic.

One of the newest global trends is the development of autonomous vessels, which will sooner or later find their way into your VTS areas and will need to be dealt with by your VTS operators.

I am thankful for the fact that all of you decided to join this important event and to offer your knowledge and insight to IALA, which will enable us to develop a state of the art VTS model course, which will provide guidance to VTS training organizations worldwide for the next decade.

You are here in the company of the pioneers who came up with the idea of standardized VTS training worldwide and we should have a good chance of getting this right.

I also thank them for their dedication to this important task.

With this, I wish you all an enjoyable workshop and again, thank you for joining us here.

2. FEATURED PRESENTATIONS

2.1 Kevin Gregory, Education and Development Manager, IALA

Kevin provided a presentation providing information on the general international regulatory framework for VTS and its relationship with the IALA standards and their associated recommendations, guidelines and model course. The IALA standards related to VTS and training and certification were explored to enable all participants to have an overview of the current framework and to set the scene for the workshop.

2.2 Jillian Carson-Jackson, Chair of IALA VTS Committee Working Group 3 – VTS personnel and training

Jillian updated all workshop participants on the current work being undertaken by the IALA VTS Committee with respect to the review and update of IALA Recommendation R0103 (V-103) and its associated model courses. Participants were updated on the work that had been completed with Recommendation R0103 and the timeline for its finalisation along with the plans for the update of the VTS model courses. Jillian also provided participants with a briefing as to how the break-out groups would function during part one of the workshop.

2.3 Stefaan Priem, Vice Chair of IALA VTS Committee Working Group 3 – VTS personnel and training

Stefaan provided an update during the opening pf part two of the workshop. The main outcomes from each of the breakout groups in part one of the workshop were summarised. Stefaan provided participants with a briefing as to how the break-out groups would function during part one of the workshop.

3. GOALS AND OBJECTIVES OF THE WORKSHOP

The primary objective of the workshop was to obtain first-hand information from those involved in VTS operations and training to enable the IALA VTS Committee to review and update the IALA V-103/1 VTS Operator Model Course by identifying the current needs of the profession and assessing the key competencies desired against the existing curriculums.

Five break-out groups were established to explore the key competencies of a VTS Operator and then to consider these against the current curriculum in the V-103/1 Model Course. Each breakout group was given a general question/theme to enable the discussions to be framed around one or more modules of the model course.

4. BREAKOUT GROUP 1 – CHAIR, HENRY HENG

Group 1 was tasked to look at the work of a VTS Operator when taking or handing over a watch and to review the contents of Modules 2 and 7 of V103/1.

Handing or taking over a watch could become a very routine affair and the VTS Operator may get complacent and take things for granted, but it is very important that the Operator taking over must be briefed properly.

It should not be done at critical situation such as a close quarter situation between vessels but wait until the situation improves before handing or taking over. A checklist should be developed to assist the handing/taking over a watch.

It is necessary for the VTS Operator to have good PR skills to establish and maintain good working relations with own staff and stakeholders, and any conflicts should be resolved quickly so as not to affect the Operator in carrying out his/her job effectively.

The Group suggested that the topic 'VTS Environment' under Module 2 could be retitled to 'Traffic Management Measures' as the sub-topics are all related to measures be put in place to manage the vessel traffic. As for the topic on 'Safety related ship certificates', the discussion noted that in some countries, the VTS Operator has no sight or access to the validity of the certificates. These safety ship's certificates, and trading certificates are usually required to obtain port clearances and, in some ports, the VTS Operator actually has to check the system that the vessel has obtained the port clearance certificate prior allowing the vessel to depart.

The VTS Operator must have good knowledge of the local and international regulations, understanding the roles and responsibilities of master/pilot/allied services and the traffic in their VTS sector. He/she must also know the importance on the exchange of information which may affect the safe movement of the piloted vessel as well as the movement of other vessels in the area.

Although we had some time constraint, I can feel that the group had very strong interest and were very eager to participate because of the relevance of this VTS Training Workshop to our respective line of work, being very much involved, if not directly involved, to identify the competence and skills required for a VTS Operator. The group has also generated a wealth of information and experience in the two days of discussion.

5. BREAKOUT GROUP 2 – CHAIR, NEIL TRAINOR

Group 2 was tasked with defining the key competencies required for VTS personnel to *"manage the traffic in their area to ensure both safe and efficient navigation*" on a daily basis.

Recognising that the current V-103 Model Course has not been updated since 2009, this was undertaken in two steps during the two-part workshop:

Part 1 – Identifying the key competencies using a "clean sheet of paper" approach. That is, the group focused on identifying required competencies without undertaking a detailed review of the current Module 2 of the V-103/1 model course.

The Group also identified competencies that may be better undertaken as part of On-The-Job training.

Part 2 - Completing a preliminary gap-analysis by comparing the outcomes from Part 1 with the subject areas and associated elements described in *Module 2 – Traffic Management* of the current model course to identify:

- Subject areas not included, or not adequately included in the existing module; and
- Elements not covered in the current subject areas.

The group also ranked the subject areas using the 1-5 scale provided.

In considering the existing subject areas in Module 2, the Group concluded:

- ***Regulatory Requirements*** - The existing subject area should be expanded to include:
  - International Framework and national Law
  - Traffic Management Measures (this contains much of the existing '*VTS Environment*" subject below)
  - Compliance and enforcement.

Consideration should also be given to amending the title of the subject area to "*Regulatory and Legal Framework*".

- ***Roles and Responsibilities*** - Additional elements were identified for inclusion under this subject area such as harbour Master / Marine Exchange, Loading Master and Shore based pilotage.
- ***VTS Environment*** - The Group concluded the elements of this subject area should be included under "*Regulatory and Legal Framework*" as described above.
- ***Principles of waterway and traffic management*** – Additional elements were identified for inclusion under this subject area such as slot management, temporary lay-up areas, anchorage areas and VTS special areas.
- ***Traffic monitoring and organisation*** – It was identified that this subject area covers the core operational component of VTS and should be expanded into the following new subject areas:
  - ***Situational awareness*** (e.g. current traffic, expected traffic, participating and non-participating ships, etc).
  - ***Provision of timely and relevant information*** (e.g. traffic information, navigation information, meteorological information, route exchange, etc).
  - ***Monitoring and management of vessel traffic*** (e.g. early detection and intervention, Decision support tools, decision making, etc).
  - **Responding to unsafe situations** (e.g. a ship unsure of its route or position, a ship at risk of grounding or collision, etc).
  - ***"Hotspot" detection*** – areas more prone to incidents.

General discussion also concluded that:

- VTS has become much more interactive and proactive since the Model Course was last revised and this needs to be reflected it its revision.
- Consideration should be given to amending the name of Module 2 to "***Managing Traffic*** - *Safety and efficiency of navigation and protection of the marine environment*" to reflect the nature of modern VTS.

At the beginning of Session 2 of the workshop the Group was requested to also consider Module 8 – Emergency Management of the current model course, however there was insufficient time for the Group to undertake this additional task.

6. BREAKOUT GROUP 3 – CHAIR, STEFAAN PRIEM

During the first day of the Workshop the breakout group identified a number of competences regarding VTS Communication that are not included in the current V-103/1 Model Course or that are included yet may deserve more attention in the model course. During the second day the elements related to VTS Communication in the current model course were reviewed and given a score from 1 to 5 to indicate their relevance today or in the future. The breakout group concluded its activities with a final discussion on the most important topics of the two days.

Plenty of time went to the current IMO SMCP and its relevance today. Although SMCP is regarded as a standard for VTS Communication, participants considered it out of date and no longer efficient to train VTS operators. IALA guideline on VHF Communication seems to take over the role as key document regarding VTS Communication.

The legal aspects and implication of message markers in general and the message marker "Instruction" specifically, are not clear at all times. This could be addressed in future updates of IALA documents.

The sender's emotion or the sender's state in VTS Communication is another topic the breakout group paid attention to. Anxiety, anger, fear, fatigue, rush, intoxication could be deducted from VTS communication without being literally mentioned. It is important that a VTS Operator is able to distinguish these in order to make a solid estimate of a vessel traffic participant.

The ability to communicate under pressure and in a small-time frame is another challenge that should be dealt with in V-103/1.

Uncommon terminology or local dialects may be used within a VTS area, but not understood by all participants in the VTS area. The VTS Operator should be able to ensure that all important communication is clear to all relevant participants and stakeholders.

Attention was given to the increasing role of digital communication and how to make sure the VTS operator can use these at all times, while ensuring that other tasks can be carried out at the same time.

The breakout group also highlighted to growing number of tasks to be carried out by the VTS operator at the same time. This poses challenges to identify the key tasks, and the ability to prioritize duties in a correct manner.

Regarding the log and record keeping the participants agreed this is a vital part of VTS. However, time constraints may affect the ability to perform decent log keeping while VTS supervisor may also be involved in this task.

Finally, the breakout group considered autonomous vessels and its communication as one of the key challenges for the upcoming years. It is of vital importance a VTS operator is aware what to expect from these vessels (or what not to expect), also on the matter of communication.

7. BREAKOUT GROUP 4 – CHAIR, DIMITRY ROSTOPSHIN

The task of Group 4 was to review module 3 Equipment and provide the ideas how does a VTS Operator use technology ensure both safe and efficient navigation. The participants of the Group identified number of gaps in the existing model course, in particular made a focus on following items:

Training should be focused not on the equipment itself but on a practical information how to use the equipment to conduct the tasks of VTS operator and based on procedures. Training should cover both advantages and limitations of the typical equipment used in VTS. Important aspects in such training would be Human-Machine interaction, including interpretation of information, user interfaces, human errors, quality of data, over relying on technologies and misuse of the equipment.

The current model course is more focused on sensors rather the software applications, but in the modern VTS decision support tools and data processing principles could be even more important.

Among traditional sensors used in VTS for years training must include overview of new technologies both in sensors and data processing, such as long-range sensors, e-navigation, data sharing etc.

Cybersecurity aspects must be included into model course as important topic covering all aspects of data protection.

8. BREAKOUT GROUP 5 – CHAIR, JILLIAN CARSON-JACKSON

Group 5 focused on what a VTS Operator does to ensure that they are an effective and efficient member of the watch team. In essence, this covered Modules 5 and 7 of the current V103/1.

The discussions noted the importance of interpersonal interactions, not only as part of the VTS team, but as part of the extended maritime management team. Some key aspects of personal traits included being of clean and sober disposition, able to work effectively as a team player with emotional control, leaving personal issues outside the operations centre. The ability to have control of your emotions was discussed as being critical to being an effective member of the watch team. Other key factors include maintaining a professional attitude, managing physical health and monitoring fatigue.

Work carried out on Bridge Resource Management has provided some solid basis for overall watch team training, including challenge and response and a shared mental model of what is happening during the watch. The VTS is an extension to the resources available for safe navigation, and there would be benefit in including BRM elements in VTS team training. In addition, for ships officers, there could be value in highlighting the opportunities of VTS to support the bridge team. Another aspect of being an effective member of the VTS watch team is ensuring good cyber hygiene, and that training should be provided on cyber security.

Reviewing the ideas identified in Part 1 of the workshop, during Part 2 the group grouped the elements together to provide a general overview of the personal attributes required. In addition, a number of communications elements were noted, such as respecting cultural and professional differences when dealing with inter-personal communications. The more difficult to assess elements were also reviewed, such as having a sense of responsibility, exhibiting a professional attitude and maintaining control of emotions, especially in emergency situations. It was stressed that there is a need to clearly identify the legal aspects of communication.

The group provided a broad range of experience and shared their expertise freely. The on-line nature meant that many operational VTS personnel and trainers were able to participate, which provided a depth of input that may not have been possible in a face-to-face (F2F) workshop.

9. WORKSHOP CLOSING

9.1 Kevin Gregory, Education and Development Manager, IALA

Kevin provided a brief summary of the next steps for the review and use of the outcomes from the workshop. A report would be prepared with all of the output from the breakout groups which would be submitted to the IALA VTS Committee for further consideration. Additionally, participants were reminded the further input on the topic areas discussed would be welcome in the coming weeks.

The outcomes of each breakout group have been collated and are available at Annex A to the report.

9.2 Closing remarks by the Dean of the IALA World-Wide Academy, Omar Frits Eriksson

It was a great pleasure for us to see so many participants here at this first IALA virtual Workshop. We hope that the event met your expectations, you certainly met our expectations and more.

IALA has two strategic goals. The first being to harmonize Aids to navigation and VTS principles worldwide and the second being to get all coastal states to use and implement these principles. With your assistance we have contributed towards the realization of these strategic goals which we are hoping to achieve fully within a few years.

I therefore thank everyone for joining this important event and to offer your knowledge and insight to IALA, which enables us to continue our work on improving the VTS model courses, which can and will provide guidance to VTS training organizations worldwide for the next decade or so.

I also want to thank the facilitators for their very valuable work in preparing and executing this event in such a professional and effective manner.

ANNEX A OUTCOMES FROM PART ONE OF THE WORKSHOP

This workshop will be held in two parts of around 90-minute duration.

Part one of the workshop is designed to consider the actual competencies that a VTS Operator uses on a day-to-day basis without reference to the IALA V-103/1 Model Course.

Part two of the workshop will consider the outcomes of part one to create a gap analysis against the existing IALA V-103/1 Model Course.

For part one of the workshop, think about the entire watch of a VTS Operator, from arriving to relieve the off going VTS team through to handing over to the oncoming VTS team some hours later.

Describe the key elements of skill, knowledge and attitude that a VTS Operator needs to ensure that the watch is successful? Consider both routine and non-routine situations that a VTS Operator may experience.

A simple example has been provided in each section.

For each element below, initially focus on the topic that your break-out group has been allocated, this will ensure that we have input on all topic areas. Aim to describe at least 10 areas of competency that the VTS Operator needs to ensure that the watch is successful in the elements outlined below.

Aim to spend about 15 minutes on your primary topic. Once you have completed your analysis of the primary topic that you have been allocated, please move on to consider the other topics in the remaining time available.

Feel free to complete all or part of this table before the workshop to assist in the discussions. If you do complete the table yourself, please share the results with IALA so that they may inform and contribute to our work – kevin.gregory@iala-aism.org

1. What does a VTS Operator do when taking over or handing over their watch?
Oncoming officer is aware of active movements in port • Arrivals and departures of vessels • Vessels on the move • Special activities such as diving/ROV etc.
Check the status of the VTS equipment
Status of Meteorological Weather in the area • both present and future weather forecast
Special projects in the area
Status of AtoNs
Check if the incoming officer is fit to take over the watch
Check if there is any instruction from Harbour Master
New changes and procedures in SOPs
Status of service providers (Tugs, pilots, bunkering, linesmen etc.)
Check the vessels visually from the observation tower
Any other issues that are likely to impact the watch
The traffic conditions in the harbour
Tidal conditions in the port acquire and maintain situational awareness
prioritise and act on operational and admin tasks as required during the shift
Incoming briefing is accepted by the incoming officer
Navigation Information and warnings such as AtoNs, Bunkering Ops, STS, Diving, Slow Speed / No wake areas, Exclusion zones, ship safety zones, Survey ops.
Waterway conditions - congestion, visibility, special transports, hampered v/ls etc

2. How does a VTS Operator manage the traffic in their area to ensure both safe and efficient navigation?
Situation Awareness – Ability to monitor and plan based on situational awareness • Current traffic • Predicted traffic • Allied services • Participating and non-participating ships
Hotspot detection – areas more prone to incidents
Provision of timely and relevant information • ENAV (e.g. route exchange) • Traffic information • Navigation information • Regular / routine / deemed necessary • Met information
Monitoring and management of vessel traffic • Monitoring – Traffic image (Radar, AIS, CCTV, Inmarsat C, RDF) • Interaction before anything goes wrong / early intervention • Use of Decision Support Tolls (alarms, etc) • Decision making • Under Keel Clearance • Air Draft clearance
Responding to unsafe situations (e.g. Deviating from route)
Procedures
Regulatory framework
Means to manage traffic (Interaction) • Communications – VHF • AIS • VDES

Ensure all AtoNs are operational especially at night
Aware of speed restrictions
One-way traffic • implement a temp one-way traffic for certain type of vessel to clear the channel/fairway
ensure COLREGS are complied
Monitoring and management of vessel traffic • this needs the operator to have local knowledge (e.g. traffic patterns, monitoring of traffic with sensors, use of DST, radio comms)
Ensure local rules are complied with
Keep monitoring of VHF Ch. 16 and other required channels in port
Ensure there is sufficient anchorage space/navigable waters for vessels
Ensure navigation warnings are issued when needed
Use of VTS sailing plans, require ship reports, use time slots and abort points
Maintain a situational awareness of both participating and non-participating ships entering the VTS area, events that are going on
Have procedures, contingency plans in place
Responding to unsafe developing situations, for example to monitor, apply appropriate decision making and interact as appropriate

3. What skills does a VTS Operator need to effectively communicate with vessel traffic and other stakeholders in their area?
• Understanding and applying SMCP
• Importance of listening to the emotions (fatigue, anxiety, anger, …) behind the message which may contain extra information. Additional training may be required to be able to understand and distinguish these emotions.
• Importance of understanding cultural aspects and different dynamics in their communication.
• Verbal skills with English
• Knowledge of specific terminology of vessels, of navigation, of the local VTS area, of phrases used by deck officers and terminology used for new technology on board.
• Knowledge of the local language (slang) that's being used in the area. Being able to "translate" these communications towards other stakeholders in the area so they are aware of it.
• The role of digital communication (typing messages) and combining this with the other tasks of a VTS operator. Use of specific language (and abbreviations) in digital communication (e.g. AIS-messages).
• Competences related to communication equipment
• Combination of typing messages and radar observation could lead to dangerous situations.
• Information and route exchange between VTS and autonomous vessels. Has to be presented in a way that is clear and unambiguous for everyone (including VTS)
Concise, accurate and timely conversation
Rate of speech, Standard message structure, Clarity, Voice projection, Emphasise keywords
follow standard communication phrases, SMCP
Questioning techniques - Open / Closed questions
Display professionalism when communicating to the shipmasters & pilots
Relevant info only, no extra conversational words
understand their procedures and how they should communicate with all parties
Written skills - report writing and log keeping
in case of emergency, shift to another channel

be qualified (e.g. radio operator)
Communication with the vessel's BRM team. how the operator interacts with the port team e.g. allied services.
Use of repetition and read back
they also need to understand the regulatory framework and how to undertake compliance and enforcement activities
Voice Communications – clear, concise and unambiguous **Digital Communications** – clear, concise and unambiguous
Phraseology – SMCP / VTS Phraseology
Ability to make effective decisions under pressure Ability to manage situational awareness while monitoring developing situations / incident
Knowledge of local processes for interacting with allied services and other stakeholders
Ability to master technologies and changing technologies
Qualified Radio Operator, GMDSS
• Concise, accurate and timely conversation
• Rate of speech, Standard message structure, Clarity, Voice projection, Emphasise keywords
• follow standard communication phrases, SMCP
• Questioning techniques - Open / Closed questions
• Display professionalism when communicating to the shipmasters & pilots
• Relevant info only, no extra conversational words
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• Written skills - report writing and log keeping
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• Communication with the vessel's BRM team. how the operator interacts with the port team e.g. allied services.
• Use of repetition and read back
• they also need to understand the regulatory framework and how to undertake compliance and enforcement activities

4. How does a VTS Operator use technology ensure both safe and efficient navigation?

What operator need to know:

- Equipment using in VTS operations
- Possibilities and limitations of the equipment
- Status and possible failures

Procedures (incl. emergency)

Human – Machine interaction in general:

- Procedures how to use technologies
  - Tips and tricks
- Interpretation of information
- User interfaces, human centric approach
- Over relying on technologies

Misuse of the equipment

Communication and communications equipment

- Voice
- Text messaging
- Video, social networking and other modern means of communications
- Point to point and point to multipoint comms

Sensors

- Radios (comms range etc)
- AIS (AIS technology, AIS regulations)
- Radars (radar principles, coverage, blind zone)
- CCTV / EOS

Software applications:

- Using and visualisation of ENC
- Decision support tools
  - What decision support needed
  - Usage of tools of experienced personnel and newbies
- Using of the software (tools and features – zoom / focus to the area / prediction ……..)
  - Why operators don't use some of the tools – are they badly designed or there is training issue and misunderstanding how to use them?
- Recording and replay
  - Debriefing / investigations of incidents and near misses
- Data processing and fusion

• Performance monitoring of the equipment – status, failures, redundancy • Planning tools for traffic management (informational system, data sharing, voyage exchange) • Under keel clearance applications Type specific training

New technologies
• Sharing information between stakeholders
• E-Navigation (digital data exchange, standards, use-cases and applications)
• Cybersecurity
  ○ Principles
  ○ Detection of cyber threats
• Autonomous shipping
• Artificial intelligence and machine learning
Virtual reality

Importance of being aware of equipment / systems limitations
Awareness of sensor technologies and the differences between them
Be familiar with the equipment
Basic understanding of technology – not how it all works but understand how to use it for the job they do.
Interpretation of information provided by the technology
Specification for the equipment – includes AIS, GPS (GNSS), GMDSS (some have DSC with the VHF; some VTS are included in GMDSS response), Radar, (part of SAR in Croatia, Saudi Arabia, Canada – MCTS,
Drone monitoring / vessel surveillance (pollution, monitoring vessels).
STM? Route exchange use?
Croatia – comment on passage plan for approval – (part of STM) – not using RTZ at the moment, sending the passage plan/ VTS reviews and, if required, sends back changes.
CCTV with Thermal viewing (Brazil, Saudi Arabia, Croatia) – adding thermal to provide more information on fishing boats at night / Range of view with CCTV / Thermal – 15nm For monitoring / also for security support (call police)
Radar ARPA
Recording (all data)
Decision support tools
ECDIS – as separate tool or as part of DST
Understanding the layers of information / understanding the underlying data – benefits and errors
Meteorological equipment
UKC management / included in some systems (real time data available)

Developing – 3D data displays (also used with 3D for UKC)
Know that not all centres have the same equipment
ARPA

5. What does a VTS Operator need to do to ensure that they are an effective and efficient member of the watch team?
Team player
Sober / clean / cleanliness
Professional Attitude
Flexible attitude
Ready to improve – think about how to improve the workplace (not just receiving information / sharing information on how to improve the operations / workplace)
Not the best individual / make the team the best – think about the whole team
Share the workload / provide assistance when required
Accept that people make mistakes (tugs, pilots, boatmen, VTS) adjust the plan accordingly
Patience
Self-discipline
Punctuality
Self-control / control your feelings – control emotions / emotional intelligence
Improve personal training / learning – self-improvement – CPD (continuing professional development)
Responsibility to themselves and the team (for the work that they do / quality of work)
Share knowledge / don't hoard information
Manage Fatigue
Leave personal 'stuff' at the door
Respecting other personnel
Maintaining health
Respect job description
Respect other people in the area – Do not enter in the other people shoes
Avoid conflict between standard VTS tasks and administrative tasks. Ability to focus on VTS tasks only when necessary.
Importance of refresher/revalidation training, 1) for keeping the certificate valid but 2) also to maintain level of competences. Make sure there's room for extra training outside of the mandatory refresher/revalidation courses.
Limitations of the length of the watch or the hours behind the screen in respect to the VTS O's capabilities.
Confidence of the VTS operator to be able to raise difficult issues or to work together with tough personalities at the VTS centre or in the VTS environment.
Site visits to stake holders to know what their needs are and to know what faces are behind the names.

Courses of insurance policy regarding salvage and emergency towing situations (VTS operator may be responsible to take vital decisions in some countries)
In some countries a VTS operator is but one of the many different roles the person may fulfil (pilot, SAR watch officer, …). Make sure that they know what role they are conducting at what time.
Be sober and in good health
Promote teamwork, Be non-confrontational, Flexible and adaptable, Honest and accountable
Make sure have good communication and rapport with colleagues
Be alert and attentive all the time
Ensure operators are aware of any new procedures, seek clarification if in doubt
Know and understand the significance of the role and responsibility of being a VTSO including the possible consequence of not carrying out the duties effectively
Encourage mutual support and backup behaviour
Follow procedures
Not to panic during emergency
Maintain professional standards
No distractions in the centre such as usage of mobile phones at the workstation.
have the skills to analyse, make decisions and interact effectively
Operators need to be qualified and competently trained

ANNEX B OUTCOMES FROM PART TWO OF THE WORKSHOP

Part two of the workshop is designed to consider the subject outlines of many of the modules of IALA Model Course V-103/1 alongside the outcomes of part one of the workshop. This will help the VTS Committee ensure that the course covers the key areas of knowledge, skill and attitude that a VTS Operator needs to conduct their duties in a harmonised and professional manner.

During this part of the workshop, you will have around one hour in breakout groups. In your breakout groups, commence your discussions with the same primary question as Monday. Again, if time permits, you are free to consider the other areas under consideration.

Review the existing subject outline for each module allocated to your group. For each element, or group of elements, try to assign a rating to the content to indicate whether it is:

1. **critical to keep (still valid)**
2. **important to keep**
3. **nice to have**
4. **no longer required**
5. **not sure whether it is required or not**

Time permitting, consider the feedback from part one of the workshop. From this content, try to identify within the comments section, or by highlighting and annotating the output text from Monday what:

- **is missing from the current subject outline**
- **may need to be changed or updated in the subject outline**
- **may influence the subject outline of another module**

There is also space for general comments, expectations and important points that you may wish the VTS Committee to consider.

It is recognised that there is a lot of content here to review in the time available. Feel free to complete all or part of this table before the workshop to assist in the discussions. If you do complete the table yourself, please share the results with IALA so that they may inform and contribute to our work – kevin.gregory@iala-aism.org

Rating Scores
1.critical **2.**important **3.**nice to have **4.**no longer required **5.**not sure whether it is required or not

Group 1
Original context, what does a VTS Operator do when taking over or handing over their watch?

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points

Module 7 – Personal Attributes		**Group 1 feedback (Henry Heng)**
		
		• Handover of information between VTS operators
		  ○ Active movements in port
		  ○ Arrivals and departures of vessels
		  ○ Vessels on the move
		  ○ Traffic conditions in the harbour
		  ○ Waterway conditions - congestion, visibility, special transports, hampered v/ls etc
		  ○ Special activities such as diving/ROV etc.
		  ○ Check the status of the VTS equipment
		  ○ Status of AtoNs
		  ○ Status of Meteorological Weather in the area
		  ○ Navigation Information and warnings such as AtoNs, Bunkering Ops, STS, Diving, Slow Speed / No wake areas, Exclusion zones, ship safety zones, Survey ops.
		  ○ Tidal conditions in the port
		  ○ Both present and future weather forecast
		  ○ Special projects in the area
		  ○ Any other issues that are likely to impact the watch
		• Check if the incoming officer is fit to take over the watch
		• Incoming briefing is accepted by the incoming officer
		• Check if there is any instruction from Harbour Master
		• New changes and procedures in SOPs
		• Status of service providers (Tugs, pilots, bunkering, linesmen etc.)
		• Check the vessels visually from the observation tower
		• Acquire and maintain situational awareness
			Maybe should include a new topic such as "Principles of effective handovers" with possible sub-elements of:
			• Preparing outgoing handover
			• Exchange task-relevant information between outgoing and incoming operators
			• Cross-checking of information by the incoming operator as they assume responsibility for the task
			
			I would consider the public to be but one VTS Stakeholder?
			
			The relationship with all VTS Stakeholders does indeed covers both internal and external. The negotiations are probably covered by the term relationships.
			
			I would rate punctuality and attentiveness as important rather than critical.
			
			Conflict resolution is a critical element for VTS staff.
			
			We are usually at the sharp end of commercial interest's vs safety!
			
			Critical for international regs and national regs if anything regulatory and legal framework should be a dedicated module on its own.
			
			Ship certs are probably nice to have. Not all operators have access to the info either.

Interaction with others and human relation skills			
Public relations	**3/4**		
Establishing and sustaining a good working relationship with VTS stakeholders	**1**		
Negotiations with VTS stakeholders	**1**		
Successful conflict resolution	**1**		
Team working skills	**2/3**		
Responsibility and reliability	1		
Safety awareness			
Health awareness	1		
Punctuality	1/2		
Attentiveness	1/2		
Importance of maintaining the trust of all	1		
Module 2 – Traffic Management	**Rating**		
Regulatory requirements	1		
International regulations			
National regulations including local bye laws	1		
Legal liabilities of VTS functions	1		
Safety related ship certificates	3		
Roles and responsibilities	1		
Ship masters	1		
Marine pilots	1		
VTS	2/3		
Allied services			

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
VTS environment (to be retitled to Traffic Management Measures) Area limits, boundaries, separation zones, shipping lanes and channels Prohibited or dangerous areas, safety zones, anchorages and restricted areas Traffic separation schemes Traffic separation criteria Geographical constraints	 1 1 1 1 1 1	• Prioritise and act on operational and admin tasks as required during the shift	Most often its Safe Manning that is the important one. Safety construction, safety radio certs are usually not too important. All critical except allied services which is a little less important? VTS environment possibly needs to be retitled to "Traffic management Measures" and worthy to be taught at a high level so that a VTSO has a broad understanding of these measures. Agree the title will be out of step when we start talking about Traffic Management techniques rather than level of service I would be happy with critical for all but wonder if the traffic separation schemes and criteria are one and the same? They are known IMO routeing measures Handover techniques could be tested during the simulation sessions
Principles of waterway and traffic management Planning Risk management Allocation of space Criteria which determines the parameters for the safe passage of shipping Aids to navigation	 1 1 1 1 1		
Traffic monitoring and organisation Traffic patterns VTS sailing or route plans Situation analysis	1 1/2 1		

Group 2
Original context, how does a VTS Operator manage the traffic in their area to ensure both safe and efficient navigation?

Group 2 **Module 2 - Managing Traffic - Safety and efficiency of navigation and protection of the marine environment**				
V-103/1 current subject outline **Module 2 – Traffic Management**	**Rating**	**Breakout group feedback from part 1**	**Feedback from part 2** **Comments / expectations/ Why is it important?**	**Rating**
Regulatory requirements International regulations National regulations including local bye laws Legal liabilities of VTS functions Safety related ship certificates	**1**	**Regulatory and Legal Framework** • UNCLOS • International Convention for the Safety of Life at Sea (SOLAS) • Resolution A.857(20) Guidelines for Vessel Traffic Services • COLREGS • IALA Standards • National Law • Local provisions **Traffic Management Measures (**moved from VTS environment**)** • Area limits, boundaries, separation zones, shipping lanes and channels • Prohibited or dangerous areas, safety zones, anchorages and restricted areas • Traffic separation schemes • Traffic separation criteria • Geographical constraints Note - Also important items for inclusion in On-the-Job Training (i.e. VTS specific issues to consider) **Compliance and Enforcement** • National Framework / Policy	The trainee is formally assessed as competent in their understanding of the Regulatory and Legal Framework for VTS in undertaking their day-to-day duties?	**1**
Roles and responsibilities Ship masters Marine pilots VTS Allied services	**1**	Possibly include role/responsibility associated with: • Harbour Master / Marine Exchange • Loading Master • Shore based pilotage	The trainee is formally assessed as competent in their understanding of the roles and responsibilities of all stakeholders?	**1**
VTS environment			**See above** – “VTS environment” should be part of Regulatory and Legal Framework	

Group 2 Module 2 - Managing Traffic - Safety and efficiency of navigation and protection of the marine environment				
V-103/1 current subject outline Module 2 – Traffic Management	**Rating**	**Breakout group feedback from part 1**	**Feedback from part 2 Comments / expectations/ Why is it important?**	**Rating**
Area limits, boundaries, separation zones, shipping lanes and channels Prohibited or dangerous areas, safety zones, anchorages and restricted areas Traffic separation schemes Traffic separation criteria Geographical constraints				
Principles of waterway and traffic management Planning Risk management Allocation of space Criteria which determines the parameters for the safe passage of shipping Aids to navigation	**1**	Consideration should be given to including the following: • "VTS Special Area" (US) • Hot-spot areas (Singapore) • Slot Management • Temporary lay-up areas • Anchorage areas	Competency in maintaining a safe and efficient waterway	**1**
Traffic monitoring and organisation Traffic patterns VTS sailing or route plans Situation analysis	**1**	**Situation Awareness** – Ability to monitor and plan based on situational awareness • Current traffic • Predicted traffic • Allied services • Participating and non-participating ships	Competency in maintaining situational awareness and identifying developing situations and responding accordingly	**1**
		"Hotspot" detection – areas more prone to incidents		**1**
		Provision of timely and relevant information • ENAV (e.g. route exchange)		**1**

Group 2 Module 2 - Managing Traffic - Safety and efficiency of navigation and protection of the marine environment				
V-103/1 current subject outline Module 2 – Traffic Management	**Rating**	**Breakout group feedback from part 1**	**Feedback from part 2 Comments / expectations/ Why is it important?**	**Rating**
		• Traffic information • Navigation information • Regular / routine / deemed necessary • Meteorological information		
		Monitoring and management of vessel traffic • Monitoring – Traffic image (Radar, AIS, CCTV, Inmarsat C, RDF) • Early detection and intervention - *Interaction before anything goes wrong* • Use of Decision Support Tools (alarms, etc) • Decision making • Under Keel Clearance • Air Draft clearance • Vessel type and characteristics	Competency in using these tools to monitor and provide information, advice, warnings and instructions as deemed necessary	**1**
		Responding to unsafe situations (e.g. Deviating from route) • a ship unsure of its route or position • a ship that has defects or deficiencies, such as navigation or manoeuvring equipment failure • a ship at risk of grounding or collision • Sinking **Note** – Consideration be given to “Responding to unsafe situations” being stand-alone Topic	Competent to proactively interact and provide of navigational support: • At the request of a ship, irrespective of whether a pilot is on board • When a navigational situation is observed by the VTS and intervention by the VTS is deemed necessary • As part of a VTS’s operational procedures	**1**
		Procedures **Means to manage traffic (Interaction)** • Communications – VHF • AIS • VDES • Sea Traffic Management and Route Exchange	These are important for managing traffic. **Note** – It is important that there is a clear link for these items to the Modules they are covered elsewhere in the course.	
Comments from other Groups in Part 1				

Group 2 Module 2 - Managing Traffic - Safety and efficiency of navigation and protection of the marine environment				
V-103/1 current subject outline Module 2 – Traffic Management	**Rating**	**Breakout group feedback from part 1**	**Feedback from part 2 Comments / expectations/ Why is it important?**	**Rating**
		Group 1 feedback (Henry Heng) • Ensure all AtoNs are operational especially at night • Aware of speed restrictions • One-way traffic. Implement a temp one-way traffic for certain type of vessel to clear the channel/fairway • ensure COLREGS are complied • Monitoring and management of vessel traffic • The operator needs to have local knowledge (e.g. traffic patterns, monitoring of traffic with sensors, use of DST, radio comms) • Ensure local rules are complied with • Keep monitoring of VHF Ch. 16 and other required channels in port • Ensure there is sufficient anchorage space/navigable waters for vessels • Ensure navigation warnings are issued when needed • Use of VTS sailing plans, require ship reports, use time slots and abort points • Maintain a situational awareness of both participating and non-participating ships entering the VTS area, events that are going on • Have procedures, contingency plans in place • Responding to unsafe developing situations, for example to monitor, apply appropriate decision making and interact as appropriate		
		Group 3 feedback (Stefaan Priem) • Avoid conflict between standard VTS tasks and administrative tasks. Ability to focus on VTS tasks only when necessary. • Importance of refresher/revalidation training, 1) for keeping the certificate valid but 2) also to maintain level of competences. Make sure there's room for extra training outside of the mandatory refresher/revalidation courses.		

Group 2 Module 2 - Managing Traffic - Safety and efficiency of navigation and protection of the marine environment				
V-103/1 current subject outline Module 2 – Traffic Management	**Rating**	**Breakout group feedback from part 1**	**Feedback from part 2 Comments / expectations/ Why is it important?**	**Rating**
		• Limitations of the length of the watch or the hours behind the screen in respect to the VTS O's capabilities. • Confidence of the VTS operator to be able to raise difficult issues or to work together with tough personalities at the VTS centre or in the VTS environment. • Site visits to stake holders to know what their needs are and to know what faces are behind the names. • Courses of insurance policy regarding salvage and emergency towing situations (VTS operator may be responsible to take vital decisions in some countries) • In some countries a VTS operator is but one of the many different roles the person may fulfil (pilot, SAR watch officer, …). Make sure that they know what role they are conducting at what time.		

Group 3
Original context, what skills does a VTS Operator need to effectively communicate with vessel traffic and other stakeholders in their area?

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
Module 1 - Language **Language structure** Message construction in English English for special purposes, redundancy and precision Elimination of ambiguity by choice of words Elimination of ambiguity by special techniques Status of a message	**1**	**Group 3 feedback (Stefaan Priem)** Understanding and applying SMCP • Importance of listening to the emotions (fatigue, anxiety, anger, …) behind the message which may contain extra information. Additional training may be required to be able to understand and distinguish these emotions. • Importance of understanding cultural aspects and different dynamics in their communication. • Verbal skills with English • Knowledge of specific terminology of vessels, of navigation, of the local VTS area, of phrases used by deck officers and terminology used for new technology on board. • Knowledge of the local language (slang) that's being used in the area. Being able to "translate" these communications towards other stakeholders in the area so they are aware of it • The role of digital communication (typing messages) and combining this with the other tasks of a VTS operator. • Use of specific language (and abbreviations) in digital communication (e.g. AIS-messages). • Competences related to communication equipment Combination of typing messages and radar observation could lead to dangerous situations.	- For general communication the focus should be on the English language but knowledge how to communicate in the local languages (if accepted by the VTS authority/Competent Authority) should be included in V-103/3 - IMO SMCP is out of date, causes confusion and is no longer considered as efficient. IALA Guideline on VHF Communication might be more useful until an update of SMCP is made - Types of emotions in VTS communications and importance of the tone of the conversation should be included in V-103/1. Take into account the VTS operator has a very short space of time to distinguish/understand these emotions and to react to the message in a proper way. - Uncommon terminology or local slang or communication with recreational traffic: transfer or translate these towards vessels involved - Importance of legal aspects and implications of giving instructions: understand where and how to use message markers (outside of the VTS area) Where do we stand with IALA - Log and record keeping is of vital importance to know WHY a specific decision was made. However, the VTS operator may find difficulties to allocate sufficient time to this task as vessel traffic will continue - General remark: there's an increasing demand for VTSO's to conduct multiple tasks at the same time (e.g. combining digital and VHF communication with screen observations). The
Specific VTS message construction Construction of messages Speech devices to imply higher message status	**1**		
Standard phrases The advantages, disadvantages and application of standard phrases The IMO SMCP in general The IMO SMCP, part 3, section 6, VTS	2		
Collecting information Questioning techniques (use of message markers, voice tone, abstract/double questions, sarcasm)	1		
Module 5 – Communication Coordination	**Rating**		
General communication skills Interpersonal communication	2 (could		

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
Procedures to enhance effective communication Verbal and non-verbal communications Cultural aspects and common understanding of messages communicated	go into OJT)	Information and route exchange between VTS and autonomous vessels. Has to be presented in a way that is clear and unambiguous for everyone (including VTS) **Group 1 feedback (Henry Heng)** • Concise, accurate and timely conversation • Rate of speech, Standard message structure, Clarity, Voice projection, Emphasise keywords • Follow standard communication phrases, SMCP • Questioning techniques - Open / Closed questions • Display professionalism when communicating to the shipmasters & pilots • Relevant info only, no extra conversational words • Understand their procedures and how they should communicate with all parties • Written skills - report writing and log keeping • In case of emergency, shift to another channel • Be a qualified (e.g. radio operator) • Communication with the vessel's BRM team in terms of how the operator interacts with the port team e.g. allied services. • Use of repetition and read back techniques • They need to understand the regulatory framework and how to undertake compliance and enforcement activities **Group 2 feedback (Neil Trainor)** Voice Communications – clear, concise and unambiguous Digital Communications – clear, concise and unambiguous (AIS, text messages Phraseology – SMCP / VTS Phraseology Ability to make effective decisions under pressure	VTS operator should be able to make sure all tasks can be performed or the VTS authority should take into account the limitations of the number of tasks a VTS operator can carry out.
Communications Collection (of information) Evaluation (of information) Dissemination (=spreading information)	1		
Log and record keeping Objective Manual log keeping Electronic log keeping Statement and report writing	1 or 2		

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
		Ability to manage situational awareness while monitoring developing situations / incident Ability to combine multiple (complex) tasks at the same time. Knowledge of local processes for interacting with allied services and other stakeholders Ability to master technologies and changing technologies Qualified Radio Operator, GMDSS	

Group 4
Original context, how does a VTS Operator use technology ensure both safe and efficient navigation?

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points

Module 3 - Equipment
Telecommunications
Fax
Telephone
Telex
E-mail
Electronic Messaging
	5
	1
	4
	1
	2
		Group 4 feedback (Dimitry Rostopshin)
		What operator need to know:
		• Equipment using in VTS operations
		• Possibilities and limitations of the equipment
		• Status and possible failures
		Procedures (incl. emergency)
		
		Human – Machine interaction in general:
		• Procedures how to use technologies
		  ○ Tips and tricks
		• Interpretation of information
		• User interfaces, human centric approach
		• Over relying on technologies
		Misuse of the equipment
		
		Communication and communications equipment
		• Voice
		• Text messaging
		• Video, social networking and other modern means of communications
		• Point to point and point to multipoint comms
		Sensors
		• Radios (comms range etc)
		• AIS (AIS technology, AIS regulations)
		• Radars (radar principles, coverage, blind zone)
		• CCTV / EOS
		• …..
		Software applications:
		• Using and visualisation of ENC
		• Decision support tools
		  ○ What decision support needed
		  ○ Usage of tools of experienced personnel and newbies
			Training should be focused on the
			• how should I use equipment?
			• what is possibilities / advantages
			• what is the limitations / problems?
			• what kind of information I can get?
			• connections to procedures
			• see IALA 1111
			• VHF comms and equipment covered by module 6
			
			Human – Machine interaction in general:
			• Procedures how to use technologies
			  ○ Tips and tricks
			• Interpretation of information
			• User interfaces, human centric approach
			• Over relying on technologies
			• Misuse of the equipment
			• Quality of data
			• Human errors
			• Equipment errors
			
			Telecommunications
			• **Not how to use the phone / email**
			• **Problems / backups / impact on procedures**
			• **Include modern ways of communications like**
			  ○ Video, social networking and other modern means of communications
			  ○ Point to point and point to multipoint comms

Radar, audio, video and other sensors Basics of coastal radar and its applications to VTS Generic VTS radar display features Audio equipment Video equipment Recording/replay equipment Meteorological and hydrological sensors	1		
VHF/Direction finding (VHF/DF) Purpose and basic principles of VHF/DF Accuracies of VHF/DF bearings	3		
Tracking systems Introduction to radar tracking systems and ARPA Introduction to manual tracking systems Introduction to use of Automatic Identification Systems (AIS) for tracking	1		
Information management VTMIS Vessel information Allied services	1		
Equipment performance monitoring Normal operation expectations	1		

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points

Troubleshooting		• Using of the software (tools and features – zoom / focus to the area / prediction ……..)
		  ○ Why operators don't use some of the tools – are they badly designed or there is training issue and misunderstanding how to use them?
		• Recording and replay
		  ○ Debriefing / investigations of incidents and near misses
		• Data processing and fusion
		• Performance monitoring of the equipment – status, failures, redundancy
		• Planning tools for traffic management (informational system, data sharing, voyage exchange)
		• Under keel clearance applications
		Type specific training
		
		New technologies
		• Sharing information between stakeholders
		• E-Navigation (digital data exchange, standards, use-cases and applications)
		• Cybersecurity
		  ○ Principles
		  ○ Detection of cyber threats
		• Autonomous shipping
		• Artificial intelligence and machine learning
		Virtual reality
		
		Group 5 feedback (Jillian Carson-Jackson)
		
		Be familiar with the equipment
		Basic understanding of technology – not how it all works but understand how to use it for the job they do.
		Interpretation of information provided by the technology
			Radar, audio, video and other sensors.
			• AIS, Radar, VHF, CCTV, DF, Weather, DSC….
			• Weather data can be outsourced incl. forecast – so it could be subscription to the data and training must to include this
			• All different setups of VTS station
			• New technologies (sensors-wise)
			  ○ Satellite AIS
			  ○ Over-horizon radars
			  ○ Solid state radars
			  ○ VDES
			  ○ Digital comms
			• VHF/DF is no longer a primary sensor and should be moved to one section up as just a secondary tool
			• CCTV / EOS solutions became more important. Also, video processing is coming into the important factor.
			
			Recording/replay equipment – should be moved to information management
			
			Tracking systems
			• Introduction to radar tracking systems
			• Introduction to use of Automatic Identification Systems (AIS) for tracking
			• Data fusion
			• Radar irregularities
			• AIS irregularities
			
			Information management
			• What is VTMIS and how it is constructed (VTS + PMIS)

Evolving technologies New technologies as appropriate	1		
Module 6 – VHF Radio			
Radio operator practices and procedures GMDSS Restricted Operator's Certificate (ROC) or internationally recognised radio certification			
VHF radio systems and their use in VTS Frequencies in the VHF maritime mobile band (ITU RR Appendix S18) National frequency assignments to VTS			
Operation of radio equipment Introduction to basic VTS VHF radiotelephone, DSC and AIS equipment Controls and operation of VHF radiotelephone equipment Controls and operation of VHF DSC equipment Controls and operation of VHF AIS equipment			
Communication procedures, including SAR VHF radiotelephone procedures VHF DSC communication procedures VHF AIS communication procedures Equipment failure and channel saturation			

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points

		Specification for the equipment – includes AIS, GPS (GNSS), GMDSS (some have DSC with the VHF; some VTS are included in GMDSS response), Radar, (part of SAR in Croatia, Saudi Arabia, Canada – MCTS,
		Drone monitoring / vessel surveillance (pollution, monitoring vessels).
		STM? Route exchange use?
		Croatia – comment on passage plan for approval – (part of STM) – not using RTZ at the moment, sending the passage plan/ VTS reviews and, if required, sends back changes.
		CCTV with Thermal viewing (Brazil, Saudi Arabia, Croatia) – adding thermal to provide more information on fishing boats at night /
		Range of view with CCTV / Thermal – 15nm
		For monitoring / also for security support (call police)
		Radar ARPA
		Recording (all data)
		Decision support tools
		ECDIS – as separate tool or as part of DST
		Understanding the layers of information / understanding the underlying data – benefits and errors
		Meteorological equipment
		UKC management / included in some systems (real time data available)
		Developing – 3D data displays (also used with 3D for UKC)
		Know that not all centres have the same equipment ARPA
		
		Group 1 feedback (Henry Heng)
		
		• Know the limitations of the Radar, VHF and the VTS system as a whole
			• What kind of information we need in regular operation (to get / to transmit)?
			• Parts of VTMS
			  ○ Computers / servers / telecommunications
			  ○ ENC
			  ○ Decision support systems and tools (critical item and need to be expanded. Also see IALA 1110)
			  ○ Recording / replay
			  ○ UKC apps
			  ○ Planning tools
			• Data sharing
			  ○ Allied services information exchange
			  ○ Publicly available information
			
			Cybersecurity
			• Data exchange
			• Sensors jamming and spoofing
			• Access to the data
			• Protection
			• E-Navigation
			
			Evolving technologies
			• Autonomous shipping
			• Artificial intelligence and machine learning
			• Virtual reality
			• E-Navigation (digital data exchange, standards, use-cases and applications)

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
		• Do not have additional work on top of the main job of the VTS i.e. the use of technology to reduce workload • Use of decision support tools - anchor guards, UKC, CQS, proximity, speed warnings • Ensure operator knows how to use the equipment • Have appropriate training in the VTS system • PMIS - Actual and predicted vessel movements Use of AIS and AtoNs - Real, synthetic and virtual • Redundancy and alternatives in case of failures • Using of technology to anticipate traffic management • Visual warnings for risk of collision from the system • Awareness of pseudo accuracy of electronic equipment, E-Nav - Route data exchange, IVEF • Develop Hotspots system – to share with master of vessels of hotspots area so that master can make informed decisions • Developing technology such as visibility monitoring and making use thermal imaging cameras • Use systems to assist with ship scheduling **Group 2 feedback (Neil Trainor)** Importance of being aware of equipment / systems limitations Awareness of sensor technologies and the differences between them	

Group 5
Original context, what does a VTS Operator need to do to ensure that they are an effective and efficient member of the watch team?

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
Module 7 – Personal Attributes		**Group 5 feedback (Jillian Carson-Jackson)** • Team player • Sober / clean / cleanliness • Professional Attitude • Flexible attitude • Ready to improve – think about how to improve the workplace (not just receiving information / sharing information on how to improve the operations / workplace) • Not the best individual / make the team the best – think about the whole team • Share the workload / provide assistance when required • Accept that people make mistakes (tugs, pilots, boatmen, VTS) adjust the plan accordingly • Patience • Self-discipline • Punctuality • Self-control / control your feelings – control emotions / emotional intelligence • Improve personal training / learning – self-improvement – CPD (continuing professional development) • Responsibility to themselves and the team (for the work that they do / quality of work) • Share knowledge / don't hoard information • Manage Fatigue • Leave personal 'stuff' at the door • Respecting other personnel • Maintaining health • Respect job description	
Interaction with others and human relation skills Public relations Establishing and sustaining a good working relationship with VTS stakeholders Negotiations with VTS stakeholders Successful conflict resolution Team working skills	**2** **1** **2** **2** **1**		Noted the hours don't really seem appropriate Pretty vague heading – need more guidance Public relations – pass to a specific area Deal with mariners Note link to OJT
Responsibility and reliability Safety awareness Health awareness Punctuality Attentiveness Importance of maintaining the trust of all VTS stakeholders	**1** **1** **1** 1 1		Missing – Professionalism / professional attitude; maintaining competence (CPD); Stressing more safety awareness / emotional awareness and control of self
Module 5 – Communication Coordination	**Rating**		
General communication skills Interpersonal communication Procedures to enhance effective communication Verbal and non-verbal communications **Cultural aspects and common understanding of messages communicated**	1 1 1 1		
Communications Collection Evaluation Dissemination	1 1 1		Need to be able to differentiate (make out) what is important information / communication

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
Log and record keeping Objective Manual log keeping Electronic log keeping **Statement and report writing**	1 1 1 1	• Respect other people in the area – Do not enter in the other people shoes **Group 3 feedback (Stefaan Priem)** • Avoid conflict between standard VTS tasks and administrative tasks. Ability to focus on VTS tasks only when necessary. • Importance of refresher/revalidation training, 1) for keeping the certificate valid but 2) also to maintain level of competences. Make sure there's room for extra training outside of the mandatory refresher/revalidation courses. • Limitations of the length of the watch or the hours behind the screen in respect to the VTS O's capabilities. • Confidence of the VTS operator to be able to raise difficult issues or to work together with tough personalities at the VTS centre or in the VTS environment. • Site visits to stake holders to know what their needs are and to know what faces are behind the names. • Courses of insurance policy regarding salvage and emergency towing situations (VTS operator may be responsible to take vital decisions in some countries) • In some countries a VTS operator is but one of the many different roles the person may fulfil (pilot, SAR watch officer, …). Make sure that they know what role they are conducting at what time.	Need to keep records / recordings Need to know why it is important (legal aspect – need to prove what's going on) Consider location – may be more of a legal requirement, group with other legal areas… Need for attention to detail. Anytime there is an incident the VTSO and the supervisor will be required to write a statement / report on the activity Discussion on limitation of liability for VTSO (note, Australian Navigation Act 2012 has the same liability as for pilots)

V-103/1 current subject outline	Rating	Breakout group feedback from part 1	Breakout group comments / expectations / important points
		Group 1 feedback (Henry Heng) • Be sober and in good health • Promote teamwork. Be non-confrontational, Flexible and adaptable, Honest and accountable • Make sure have good communication and rapport with colleagues • Be alert and attentive all the time • Ensure operators are aware of any new procedures, seek clarification if in doubt • Know and understand the significance of the role and responsibility of being a VTSO including the possible consequence of not carrying out the duties effectively • Encourage mutual support and backup behaviour • Follow procedures • Not to panic during emergency • Maintain professional standards • No distractions in the centre such as usage of mobile phones at the workstation. • Have the skills to analyse, make decisions and interact effectively • Operators need to be qualified and competently trained	

ANNEX C WORKSHOP PARTICIPANTS

First Name	Surname	Country	Organisation
Kerrie	Abercrombie	Australia	Australian Maritime Safety Authority
Mohamad	Baassiri	Qatar	QP
Kalvin	Baugh	United Kingdom	MCA
Dillon	Brown	United Kingdom	Port Of Tyne Authority (Tyne VTS)
Cameron	Butchart	Australia	Port Authority New South Wales
Mario	Calixto	Brazil	Fundação Homem Do Mar
Colin	Campbell	United States Of America	United States Coast Guard / Eight District
Jillian	Carson-Jackson	Australia	The Nautical Institute
Oualid	Chaib	Algeria	Skikda Oil Port
Eduardo	Del Angel Rincon	United States Of America	Prodar, Inc.
Gerardine	Delanoye	France	IALA
Nicholas	Ellul	Australia	VRCA
Omar	Frits Eriksson	France	IALA
Lorena	García	Argentina	Prefectura Naval Argentina
Valentino	Gasparovic	Croatia	Ministry Of The Sea Transport And Infrastructure
Antoine	Gatinaud	Singapore	Wartsila
Kelly	Glew	Canada	Canadian Coast Guard
Alexandre	Gomes	Brazil	Porto Do Açu Operações Sa
Mika	Halttunen	Finland	VTS Finland
Steve	Hardaker	Australia	Maritime Safety Queensland
Henry	Heng	Singapore	Maritime And Port Authority Of Singapore
Louise	Holman	United Kingdom	STC
Eugene	Hong	Singapore	Maritime And Port Authority Of Singapore
Jur	Janse	Netherlands	Ministry Of Infrastructure And The Environment
Nikola	Kirov	Bulgaria	Bulgarian Ports Infrastructure Co.
Michele	Landi	Italy	Italian Coast Guard - VTMIS Training Centre
Alan	Liversedge	United Kingdom	AFS Consultants
Mehul	Makwana	India	Aatash Norcontrol Ltd.
Darin	Mathis	United States Of America	U.S. Coast Guard

Yasuko	Nakai	Japan	TST Corporation
Loan	Obrien	United States Of America	US Coast Guard
Dorte	Olbæk	Denmark	Simac
Yock Foo	Pang	Singapore	Maritime Port Authority Of Singapore (MPA)
Napat	Pornchaithanapat	Thailand	Marine Department
Stefaan	Priem	Belgium	Afdeling Scheepvaartbegeleiding
Renato Feijó	Rocha	Brazil	Shield Sistemas
Barbara	Rocha Pinto de Almeida Correia	Brazil	Fundação Homem do Mar
Dmitry	Rostopshin	Russian Federation	Wartsila
Yacoubou	Salihou	Cameroon	Kribi Deep Water Port
Stephen	Sanders	United Kingdom	AFS Consultants
Andreia	Santos	Brazil	Porto Do Açu Operações
Venkata	Sateesh	Saudi Arabia	Saudi Aramco
Kyle	Simpson-Purkiss	Australia	Independent
Douglas	Soares	Brazil	Porto Do Açu Operações Sa
Diego	Tavares	Brazil	Wartsila
Milen	Todorov	Bulgaria	Bulgarian Ports Infrastructure Company
Neil	Trainor	Australia	Australian Maritime Safety Authority
Joakim	Trygg Mansson	Australia	University Of Tasmania, Australian Maritime College
Wendie	Uitterhoeve	Netherlands	Marin
África	Uyá	Spain	Sasemar
Marcelo	Villas Boas	Brazil	Rio De Janeiro Port Authority

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