



Report of the 11th International VTS Symposium

August 4 to 8, 2008

Grieg Hall, Bergen, Norway

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1 OPENING SESSION

1.1 John Erik Hagen, Regional Director, Norwegian Coastal Administration (Chairman)

After thanking the trumpeters who began the opening ceremony, John Erik Hagen introduced the delegates to Norway by means of a short video presentation. He then welcomed them to Bergen and pointed out that record numbers had registered for the symposium (380 persons from 42 countries). Having briefly described the attractions of Bergen as a popular tourist destination, he outlined some administrative details and the Conference Steering Committee, before introducing the IALA President.

1.2 Liu Gongchen, Executive Director General, China MSA and IALA President

Having added his welcome to the delegates, Captain Liu Gongchen outlined the advances made in technology in the past sixty years, which, he said, continued to improve the performance of VTS and enhance the part that it now played in e-Navigation. He went on to stress the international co-operational aspects of IALA's activities in the field of aids to navigation, the exchange of the latest information and the discussion of issues of common interests. He concluded by wishing everyone a successful week and thanking those who had helped to prepare for it. The full text of his address is provided at Annex 3.

1.3 Helga Pedersen, Minister for Fisheries and Coastal Affairs, Norway

Helga Pedersen extended a warm welcome to all present and outlined Norway's extensive maritime background and current infrastructure, highlighting how the latter has developed over the years. She focussed on the tension between sustainable, environmentally friendly but growing maritime transport. This was particularly in the context of the Arctic region and fisheries and the challenges use of maritime transport posed. This led to a brief description of recent developments on VTS in Norway, aimed at promoting vessel safety and environmental protection and how successful TSS schemes could lead to further such schemes being proposed to IMO. The importance of IALA and IMO to Norway were emphasised together with bilateral agreements, such as those that Norway has with Russia and the EU, where co-operation with EMSA and SafeSeaNet was highlighted. After mentioning Norwegian moves towards Vessel Traffic Management, she concluded with her wishes for a successful conference. The full text of the minister's address is provided at Annex 4. The IALA Secretary-General thanked the minister and presented a small gift to her.

1.4 Johan Franson, Chairman, IMO Council, International Maritime Organization

Having introduced himself, Johan Franson stressed that, despite his position as Chairman of the IMO Council, the views he would express would be his own. John Franson started by briefly covering the regulatory framework in which VTS is set and asked whether the too many words are used to cover the subject by both IMO and IALA for clarity, but went on to acknowledge how improvements in performance had been delivered, even if this is not recognised by the general public. He then went on to address the challenges currently being faced by VTS centres and VTS authorities.

Foreseeing continuing growth in the use of VTS and thus its impact on shipping, he identified training as a key issue and suggested that, as a thought for the future, the shipping community might increasingly require a minimum level of competence and

seek harmonisation of performance and levels of competence between VTS providers.

Turning to e-Navigation, he outlined progress in developing strategy at IMO and stressed the complexity it presents, given the number of identified stakeholders, both ashore and afloat.

It was suggested that there was a need for urgency if standardisation, so badly needed by the users of e-Navigation, was to be achieved and that there was a need for MSC to give a clear lead. In conclusion, the place of IALA to propose a way forward and for IMO to decide on them, was stated. The full text of his address is provided at Annex 5. IALA Secretary-General thanked Johan Franson and presented a small gift to him.

1.5 Administrative Announcements – Mahesh Alimchandani, Technical Coordination Manager, IALA

Mahesh Alimchandani introduced the IALA Secretariat team and then gave a health and safety brief, followed by some administrative announcements. He concluded by saying that the industrial exhibition was open.



VTS 2008 Symposium delegates in the exhibition area of the Grieg Hall (4 August, 2008)

2 ANNEXES

2.1 Final Programme

The final programme for the symposium, as distributed to delegates, is provided at Annex 1.

2.2 Exhibition

A list of exhibitors is provided at Annex 2.

2.3 Welcome speech by Liu Gongchen, IALA President

A speech delivered by the IALA President, Liu Gongchen, is provided at Annex 3.

2.4 Speech by Helga Pedersen, Minister of Fisheries and Coastal Affairs, Norway

The speech delivered by the Minister of Fisheries and Coastal Affairs, Helga Pedersen, is provided at Annex 4.

2.5 Keynote speech by Johan Franson, Chairman, IMO Council

The keynote speech delivered by the Chairman of the IMO Council, Johan Franson, is provided at Annex 5.

2.6 Introduction to VTS2012 by Captain Salih Orakci, Director General of Coastal Safety, Turkey

The introduction to VTS2010, given by Captain Salih Orakci, Director General of Coastal Safety, Turkey, is at Annex 6.

2.7 Social Events

A list of social events is provided at Annex 7.

2.8 Conclusions and Recommendations of the Symposium

A set of 15 Conclusions and 10 Recommendations agreed to at the symposium, is at Annex 8.

3 TECHNICAL SESSION 1 – VTS AND ITS ROLE IN GLOBAL TRAFFIC MONITORING

Chair: Mike Sollosi, United States Coast Guard

Before introducing the speakers for the session, the Chairman thanked the Norwegian authorities for the excellent organisation of the symposium opening. He explained that VTS had a key role to play in the e-NAV concept and that time was right for more global co-operation, included between VTS. He also highlighted the importance of keeping mariners and training at the centre of all future developments of VTS.

3.1 Strategic Use of VTS (Presenter: Brian Tetreault, United States Coast Guard)

Brian Tetreault recalled that the value of VTS in the enhancement of safe and efficient navigation has long been recognized, and that this traditional application of VTS can be seen as primarily tactical or involving real-time operations. He explained that with wider use of more sophisticated VTS technologies, the ability to use VTS for long term or strategic vessel traffic management, is now at hand. He examined emerging applications of VTS in this strategic realm, including analysis of VTS data in support of risk assessment, allocation of resources (such as aids to navigation and regulatory vessel traffic management measures) and applications aimed at increasing waterway efficiency. Strategic vessel traffic management will also make use of emerging Long Range Identification and Tracking (LRIT) capabilities for future vessel movement planning as well as participation in regional and international traffic management regimes, he said. He concluded that VTS will ultimately move beyond current “real time” tactical operations into predictive vessel traffic management in a strategic role.

3.2 VTS in China – Achievements and Developments (Presenter: Zhen Song, China MSA)

Zhen Song indicated that to date, there are more than 25 VTS centres (including three state-of-the-art VTS centres in Yangtze River inland waterway) with 80 or more radar stations, operating in China. All these VTS centres are integrated with the advanced national AIS network, covering the entire sea area along Chinese coast. A new national LRIT data centre is under development for implementing the IMO-mandated global LRIT system.

The presentation detailed the achievements that had been gained in recent years, and the challenges or opportunities that would be encountered in the future development of VTS for China, to enhance the safety and security of marine traffic within the framework of the global strategy on e-Navigation.

3.3 VTS and LRIT - Role in Global Traffic Monitoring (Presenter: Paul Morter, TRANSAS Telematics Ltd.)

Paul Morter recalled that the implementation of LRIT system was still underway globally, but the SOLAS amendment introducing LRIT had entered into force on 1st January 2008, with implementation required by 1st January 2009. Although there is still much to be finalised with respect to the mechanics of how LRIT will be implemented in practice by the different States party to SOLAS, the basic framework and principals of LRIT are now established.

The presentation detailed the different parts of the system, how it worked and what the expectations were. On initial inspection, VTS and LRIT, although related, have no immediately apparent relationship. However, there could be common ground between the two. Therefore, LRIT data of vessels approaching a port (and any changes to their arrival times etc) may well assist with the commercial management and scheduling of a port.

3.4 IALA NET – Maritime Safety Benefits of a Global Data Sharing Network (Presenters: George McCarthy, US Navy and Jakob Bang, DaMSA, Denmark)

George McCarthy started by giving information on the concept of open, global, maritime data sharing and the common challenges faced by nations. He then provided information on the US initiative, termed Marine Safety and Security Information System (MSSIS) and explained the origins of IALA-NET.

He stated that MSSIS is based on sharing information between governmental authorities by providing their own AIS information to the system. Forty six countries are presently sharing data through MSSIS and are using this data to augment the numerous sophisticated applications for safety and commercial purposes. The presenter outlined some of the maritime safety benefits derivable from a global data sharing network and explained that the IALA-NET demonstrator, which is a precursor of the future IALA-NET, is the combination of the MSSIS system and the HELCOM system implemented between the Baltic countries.

Jakob Bang stated that the access to the IALA-NET demonstrator was very simple and was available to all symposium delegates on the internet, with a login identity and password. A series of 250 passwords was available for the duration of the symposium. He presented the IALA-NET demonstrator live to all participants on the main screens in the auditorium. He also made a demonstration of the different capabilities of the demonstrator, which included using both live and historic AIS data information, giving the ability to analyse past situations and traffic over a certain period of time. He then demonstrated numerous other functionalities and other uses of the concept.

Questions and Answers

All but one question from the delegates were related to the IALA-NET project.

The **first** one concerned the expectation from countries belonging to regions, such as the European Union where data exchange already exists, and how the two systems could be combined. George McCarthy explained that, at this stage, MSSIS is an exchange of raw data and the regional systems could add more value. He felt that the two systems could be complementary, but that there was still a long way to go for building IALA-NET and reaping all the benefits.

The **second** intervention was more a comment than a question. It was stated that the NE Asian region, China, Republic of Korea and Japan recognise the necessity to exchange data. They advocate the development of projects aiming at such exchanges.

The **third** question dealt with the IMO position adopted a few years ago against the sharing of such data and its availability to the public. The participant asked if IMO had changed its position and also pointed out that private service providers were also involved in the same activity as the IALA-NET project. George McCarthy explained that the MSSIS system was only for the sharing of data between governmental authorities for the purpose of safety, SAR and protection of marine environment. The private sector was obviously involved for commercial purposes. The USCG saw the choice of IALA as a good balance between both systems.

The **fourth** question was addressed to Zhen Song requesting him to explain what a mobile VTS was, as referred by him during his presentation. The presenter explained that MSA used this technique in China to back up or to complete the VTS network temporarily when necessary.

4 TECHNICAL SESSION 2 – VTS AND ITS ROLE IN GLOBAL TRAFFIC MONITORING

Chair: Mike Sollosi, United States Coast Guard

4.1 Integrated Use of New Monitoring Concepts including LRIT (Presenter: John Erik Hagen, Norwegian Coastal Administration)

J E Hagen started by saying that Norway has several important maritime activities around its coastline such as oil/gas drilling etc. The main goals for the Norwegian Coastal Administration are to ensure that vessels have a safe voyage, ensure a clean marine environment, link land roads to coastal fairways and provide quality based services.

The SafeSeaNet initiative was developed in 2004, after the *Erika* and *Prestige* incidents.

Norway has 47 AIS base stations and has developed towing zones around the coast, to be utilised when incidents occur.

There is very good co-operation between Russia and Norway on information exchange. There is also good co-operation with NATO. AIS satellite technology is now being developed with a view to enhancing LRIT due to come into force by 2009. This will be particularly useful for safety, security, SAR and protection of the environment.

e-Navigation will enable more information to be available, which in turn will enable those on the ship's bridge to prioritise their operations and increase efficiency. IALA has played an important role in the development of an e-Navigation strategy.

4.2 Development of VTMS system for the Gulf of Finland (Presenter: Kari Kosonen, Finnish Maritime Administration)

Kari Kosonen discussed the Gulf of Finland Mandatory Reporting System (GOFREP) adopted by IMO and which came into force on 01 July 2004. The system operates by a trilateral agreement between Finland, Russia and Estonia. There were five phases of development which took place between 2000 and 2005.

IMO and IALA guidance (the VTS Manual and IALA Recommendation V-119) provided the basics for the development of the system.

Future operation of the system will need close co-operation between all Baltic States and interested authorities, including those in Finland. It is also important to take into account the opinion of stakeholders.

The harmonisation of reporting systems started in 2007. Three main benefits are foreseen, namely: reduced workload for mariners, reduced workload for authorities in VTS centres and cost efficiencies for shipowners.

4.3 The New Global Transparency – A Shipowners View of Tracking, Communication and e-Navigation Systems (Presenter: Peter Hinchliffe, International Chamber of Shipping(ICS))

The presentation started with an overview of the role ICS plays within IMO and other maritime organisations.

Will e-Navigation increase the danger of information overload on the bridge, the presenter asked rhetorically? There needs to be some form of filtering and prioritisation, so that the mariner can select information appropriate to the current situation.

LRIT will provide a challenge to many shipowners, as they could be in danger of non-compliance due to the new mandatory requirements. The AIS system is not designed for vertical transmission, but there is growing activity in area of the satellite tracking of AIS.

e-Navigation offers the opportunity to access all information and the inclusion of VTS is very important.

Shipping is under great pressure to reduce carbon emissions and increase efficiency. The Marine Electronic Highway in the Malacca Straits can be considered to be a test bed for e-Navigation.

4.4 Responses to the Expanding Role of VTS and Future Vision (Presenter: Hideki Kawasaki, Japan Coast Guard)

The presentation discussed the seven VTS centres in Japan and how accidents had been reduced over the years, since they started operation.

Major hazards do not help vessels trying to navigate safely, namely: fishing nets and a change in current direction, which in turn causes a major change in traffic direction four times a day.

Some case studies were shown where different VTS centres had prevented drug running, groundings and collisions.

The expected vision of VTS is to have an incident analysis database, feed back for educational purposes, development of new technologies, measures to make fishing activities less of a hazard to shipping, encouraging small vessels to carry AIS Class B Units and to make information more user-friendly.

Questions and Answers

Kari Kosonen was asked that at NAV 54, there was concern about the proliferation of ship reporting systems. In his view, how did GOFREP benefit the mariner? He stated that as more information is provided and with the inclusion of VTS, traffic is monitored. So whilst a ship reporting system on its own can be more of a burden, by incorporating VTS with it, in many ways, it acts like a VTS and provides a service to the mariner.

Kari Kosonen was also asked how use was made of formal assessment? Kari stated that the GRACAT (Grounding and Collision Analysis Toolbox) system for traffic analysis, developed by Denmark, was found useful.

J E Hagen was asked how stand by tugs were managed in the tow zones mentioned. He stated that there is good co-operation with the coast guard as well as a vessel hired commercially for this purpose. The government financed this arrangement.

J E Hagen was asked how offshore platforms were utilised to extend coverage? He stated that there was close co-operation between the various oil and gas companies and the government. The VTS Operators are well educated and trained. Harmonisation of equipment was important. This arrangement was of benefit to all parties.

Peter Hinchliffe was asked that there seemed to be a proliferation of ship reporting systems. Did this distract the bridge team? He replied that reporting systems were, in some ways, an advantage, as they enhanced safety. AIS would be able to assist by removing the need for voice communications. IMO was looking closely at the situation. Whilst VHF provides some interaction, it did not necessarily show how alert the bridge personnel were.

Kari Kosonen was asked what the technical challenges were, when three countries were involved in the same ship reporting system. He stated that no serious challenges were experienced due to the type of messages being sent / received. A lot of work had been done with respect to design - it was more a question of resources. A delegate added that it was found that by reducing the number of reporting points, voice communications were reduced. However, pilots wanted to retain the reporting points, as it gave them an up-to-date picture of where certain vessels were in their area.

5 TECHNICAL SESSION 3 – ON-GOING LEGAL ISSUES

Chair: Jillian Carson-Jackson, Australian Maritime Safety Authority

Vice Chair: John Erik Hagen, Norwegian Coastal Administration

In her introduction, Jillian Carson-Jackson said that she felt sure that delegates would be aware of a growing number of legal issues in which VTS is becoming involved.

5.1 The Role of VTS in Law Enforcement (Presenter: Tuncay Cehreli, Istanbul VTS Centre, Turkey)

The presentation was acknowledged to be selective, given the wide range over which law is spread. It began with some definitions of law enforcement and then focussed on relevant extracts from IMO documents, stressing that VTS operators needed to be legally aware and that suitable enforcement administrative measures needed to be in place. Mentioning the direct and indirect aspects of enforcement, the presentation then covered the jurisdictional, geographical and technical limits that may be present, as a background to what a VTS needs to exercise its enforcement role.

Having set the scene, Tuncay Cehreli then focussed on authorisation requirements and procedures. However, it was stressed that VTS is not a law enforcement agency but needed to interact with other agencies, and so needed to be properly prepared to facilitate this interaction. In this respect qualification, training and certification are key components.

An example of a need to enforce a general speed band was used to illustrate the challenges that enforcement may produce, much of which can arise from a lack of definition or inconsistency of understanding of terms.

The following conclusions were drawn:

- The role of VTS in law enforcement should be defined in the planning phase of establishing a VTS;
- This role of VTS should be taken into account in determining the technical requirements and staffing;
- Operational procedures and all training should be set up and organized as appropriate to this role;
- All legislative necessities should be fulfilled concerning this role before putting the VTS into operation;

5.2 Legal Implications of Sharing Vessel Traffic Information (Presenter: Jillian Carson-Jackson, Australian Maritime Safety Authority)

The presentation began by using the grounding of the bulk carrier *Pasha Bulker* off Newcastle, New South Wales, Australia, where the use of AIS vessel traffic tracking played a key role in the subsequent inquiry. A second example was also cited, with both examples emphasising the benefit of sharing data, accepting that the sensitivities involved needed to be recognised.

Starting with information exchange, the presentation then examined the implications of issues raised by what could be referred to as 'Big Brother is watching you'. This raised the question of what data should be gathered, its sources and types, not forgetting that some of the information gained could be of a personal nature, which was followed by the question - why is the data being gathered? In the context of Maritime Domain Awareness, the presenter stated that other agencies are necessarily involved, to achieve the overall required result.

Having covered the complexities so far revealed, the presentation turned to how the data ought to be gathered. It was suggested that this is not technically difficult but

when considering the legal background, both international and national, this was far from simple. In Australia, this necessitated a change in the law, a key aspect of which covered information disclosure. This, in turn, required the development of a disclosure policy. Sharing vessel track data was then used as an example of the potential legal implications for Vessel Traffic Services.

In conclusion, it was stressed that the users need to trust the framework and systems put in place and that it is the task of the authorities was to provide the lead.

5.3 Legal Implications of AIS (Presenter: Jorge Arroyo, United States Coast Guard)

Jorge Arroyo first illustrated the difference between sea lawyers and lawyers, and then took as a starting point, the sinking of the *Titanic* and how this was the key of much of today's maritime legislation. He continued with the difference in the protocols for distress messages at that time and took this forward to the handling of today's AIS messages and the question *'are there any legal implications in how these messages are handled?'*

The presentation then briefly introduced the current AIS messages and their attendant data parameters, stating that some are neglected (e.g. type of position fixing device, time stamp, position accuracy and RAIM – flag (position integrity)). As an example it was stated that recent analysis of some local traffic had shown that 5-10% of the transmitted data was incorrectly time stamped. The potential significance of such inaccuracy was then illustrated.

It was then said that, despite efforts to provide the best technical systems, the human element was always a concern. This led to the introduction of the topic of liability and its importance for both VTS and VTSOs. The subject of negligence followed, including how this may apply to an operator, together with the four heads under which it might be considered to have arisen. This was followed by the introduction of tort or a civil wrongdoing, which can lead to court actions, seeking some form of redress.

Returning to AIS and how it is used by a VTS, taking into account that the operator has no control over the data provided to it, it was stated that the difficulties will almost inevitably be encountered in future court actions but that, as yet, what they will be is unknown.

In a partial rebuttal of a statement in the Key Note speech, it was concluded that although not fool-proof, some protection needs be afforded to operators through proper documentation. This would need to recognise the best available authority on the subject and this necessarily includes IALA and IMO.

5.4 Sharing of Vessel Traffic Data – the European Experience (Presenter: Marten Koopmans, European Commission)

The presentation began with an introduction to IMO and EU legal instruments. With regard to IMO, the importance of SOLAS Chapters IV and V was stressed. Following this, it was pointed out that VTS can only be mandatory in territorial waters, which it was felt posed a natural question about 'how can this be extended beyond them?' Itemising the steps involved, the length of achieving such an objective was put at five years and the benefit to the process of IALA taking part in such a process was highlighted.

Turning to the EU, its overall legislative framework was outlined before the Vessel Traffic Monitoring Directive was introduced, followed by the Port Reception Facilities, Security and Facilitation Directives.

Looking to the future, the development of an EU policy was mentioned, including the development of a maritime strategy and a 3rd Maritime Safety Package, which includes amendments to the VTM and Port State Control Directives. This led to

mention of the importance of the EU's research arm and specifically project MarNIS.

The EU vision of VTMISS was then outlined, including the possibility of vessel traffic control. This led to discussion of the tools that would be required, including e-navigation, SafeSeaNet, developments in navigation and response tools. This was followed by an introduction to SafeSeaNet, including how it can be used to respond to an incident and its operational current status.

In conclusion, it was asked 'Is the time ripe for mandatory VTS beyond territorial waters?' This was set in the context that the EU is well underway in developing VTMISS for all EU (EEZ/SAR) waters. A final question was 'Is the next step more vessel traffic control (VTC)?' The answer seemed to be yes, but not before the next IALA VTS Symposium (2012).

Questions and Answers

In response to a question from the floor on potential legal implications for VTSOs from the *Cosco Busan* incident in San Francisco, Jorge Arroyo responded that legal proceedings were underway, which limited comment, but he was unaware of any current indications that they would impact on VTSOs.

Another question related to keeping track of information requests and subsequent follow up, Jillian Carson-Jackson responded that strict documentation procedures were in place and all such requests were monitored and the results archived.

A question was asked about AIS being drawn into the world of GMDSS...what is the position of a VTSO and a VTS Authority receiving a SART activated AIS message? Jorge Arroyo responded that there is no clear answer at the moment and, in his view, a standard of care needs to be defined. There is no legal requirement to receive or respond to such messages. A future incident may possibly lead to a legal ruling that such messages should be received and acted upon.

6 TECHNICAL SESSION 4 – RECRUITMENT AND PROFESSIONAL COMPETENCY

Chair: Terry Hughes, United Kingdom

6.1 Development of VTS Operator Work, Working Environment and Tools for Decision Making (Presenter: Sanna Sonninen, Finnish Maritime Administration)

The presentation was aimed at presenting the development of the Finnish VTSs, the analysis of the needs, including for the future, and the strategy implemented. Sanna Sonninen explained that society is increasingly placing demands on VTS as a significant player in the maritime safety and efficiency. To meet these expectations, the development of VTS should in future focus also on the content of the VTS operators work, the work environment and on the development of tools for operation. She reminded delegates of the history of the implementation of VTSs in Finland, described the present situation, including the GOFREP system, and explained how the Finnish administration develops VTSs using the “model of an activity system” as a check-list to analyse tasks and practices.

Future development steps include the need to define potential new roles of VTSs taking advantage of the new possibilities of the technical tools. Tools here mean facilities and solutions that support the decision making of the VTS operator, not only during normal operation but also in high workload situations e.g. during incident management. New tools also include possibilities for immediate risk assessment such as real-time identification of evolving risks and deviations from vessel traffic patterns. The presenter concluded by saying that the aim is to foresee the future demands for maritime safety systems and to ensure that these systems can live up to the expectations.

6.2 Is the VTS solely an Aid to Navigation, or is it Something More? (Presenter: Terry Hughes, United Kingdom)

Terry Hughes started by recalling that when vessel is approaching a port, there are three key players: the Master, the Pilot and the VTS Operator. Each one has its own role and responsibility, which is described in IMO and IALA documents. Confusion can come from incorrect communications and absence of definition of the role of the VTS or of the system providing port information.

There appears to be considerable confusion in the maritime world as to how and when navigational assistance should be provided. There have been several incidents in VTS areas (collisions/groundings) which could have been avoided had the VTS Authority been proactive. Sometimes VTS Operators do not know what to do in certain situations. This can be due to improper (or lack of) training, including in operational communications.

A VTS is more than an aid to navigation. It has to be active and proactive. To fulfil its function the VTS Operator needs to be trained according to IALA Recommendation V-103 Model Courses, what includes not only academic training, but also on-the-job training. The presenter also stressed the importance of accrediting the training system according to the IALA guidelines. He concluded saying that P&I Clubs were beginning to ask the question why are there accidents within VTS area, when the service exists to ensure the safety of navigation.

6.3 TRANSAS View on IALA Recommendations for full-mission simulators (Presenter: Holger Ericsson, TRANSAS Limited)

The presenter recalled that training on simulators is an IALA recommendation (IALA Guideline No. 1027 on Simulation on VTS Training). Indeed, a VTS simulator is a tool capable of creating realistic operational events, practices and procedures to

improve and/or access skills and abilities of personnel with a view to demonstrating their levels of competence. To achieve these tasks, TRANSAS has developed a full-mission VTS simulator, compliant with IALA requirements.

Holger Ericsson described the VTS/VTMIS simulator configuration starting with the Trainee's workplace: following the requirements of physical realism in VTS simulation, TRANSAS implemented the full VTS environment. The VTS operator workstations can be set in any configuration, from small local stations to the most modern VTMIS systems at the national scale, with the capability to control ancillary sensors. The VTS simulator can be integrated with a navigation simulator to create a realistic environment and provides communication capabilities between ship's crew and VTS operators. The Instructor's workplace includes a computer module and also the Navi-Harbour station, a VHF communication subsystem, AIS base stations, CCTV cameras, RDFs, audio/video logging to observe the trainee's behaviour; the Instructor can supervise Trainee's actions and collect the information for further analysis and debriefings.

The system also includes an assessment part, which is a fundamental aspect of training, as well as debriefing instruments.

Furthermore, following significant increase in the number of accidents that resulted during the vessels' manoeuvring and of demand in training of ship and shore personnel in one exercise, the presenter explained that TRANSAS implemented further development, thus combining the VTS simulation and Crisis Management System in single virtual environment. This project creates an integrated education tool for observation of traffic situation and the elimination of accidents consequences, providing the possibility of covering the whole range of accident and post-accident tasks.

6.4 VTS Training Free Style: The Spanish Experience (Presenter: Jose M Diaz Perez, SASEMAR / Centro Jovellanos, Spain)

Jose Diaz explained that Spain started to train VTS operators in 1993, soon after the creation of the Spanish Maritime Safety and Rescue Agency. Since then, 1500 professionals have been trained. During that time, a number of different approaches to VTS training have been explored. A first stage with MRCC/VTS/PC courses based on three weeks of lectures and one week of on-the-job training; a second stage with the addition of a VTS simulator as a powerful training tool and, finally, the shift to specific VTS courses based on IALA V-103 Recommendation.

Today, all the 350 Spanish VTS operators share a common maritime background, as all of them have been captains, officers of the watch or radio operators. For the future, a different scenario is foreseen. The shortage of officers and the absence of a new generation of seafarers, may lead to the implementation of ab-initio training schemes, following the model of the air transport industry. The presenter said that the new strategy will need much longer and comprehensive courses for future trainees, who will obviously lack maritime experience. The programme planned includes 944 lecturing hours, or 7 months courses, and is aimed at students with a university degree. Therefore, there is a new challenge to be met in the coming years, as far as VTS training is concerned.

Questions and Answers

The first question was addressed to Jose Diaz on the cost of the new training projected for the future VTS operators with no maritime background. He said that the costs have not yet been calculated.

He replied to a delegate asking if the presenter considers the VTS Operator as a job or as a profession. He explained that, although today in Spain the operators are all ex-mariners, their progression is not dependent on the certificate they hold, but rather on their VTS qualification and their performance. He then raised the issue of

fatigue saying that this question is difficult to appreciate globally as different inquiries show that each individual responds differently to the effects of fatigue.

7 TECHNICAL SESSION 5 – RECRUITMENT AND PROFESSIONAL COMPETENCY

Chair: Terry Hughes, United Kingdom

7.1 VTS Training for Great Belt in Denmark – Training by SIMAC (Presenter: Jørgen Brandt, Great Belt VTS, Denmark and Poul Pedersen, SIMAC)

This was a joint presentation, begun by Jorgen Brandt, who set the scene and said that the prime objectives of the VTS were to protect the bridge over the Great Belt and the marine environment. He gave some statistics of recent interventions, adding that it was possible to measure the height of a ship and thus its clearance under the bridge (or otherwise). Having covered the VTS' manpower and level of qualification, he then showed a recent incident involving the provision of Navigational Assistance Service, which was aimed at avoiding a potential grounding but initially complicated by probable misunderstanding of communications. Given that the waters are an international strait, it was remarked that the incident has raised as yet unanswered legal issues.

Poul Pedersen opened his part of the presentation by saying that many of the points that he wished to make had already been made by previous speakers. He went on to outline the role and capabilities of SIMAC. As this included teaching international students, he speculated that it may be a mistake to consider VTS training as a national issue.

He stressed the centrality of the IALA V 103 model courses to all VTS training before covering the need for both approved prior learning of students and the capability of a VTS for on the job training, for which it is considered best to have instructor also attend training courses. He placed great emphasis on the use of communication markers and touched on the dangers of advice becoming, or being taken as, instruction.

He concluded by describing the structure of SIMAC VTS exercises, the essential role played by feedback from them by all the participants and the benefits of a positive response by the instructors to it.

7.2 Technology never ends; what about VTS operators? (Presenter: Ko Goud, RACON)

Ko Goud began by acknowledging recent technological improvements, but then asked what would happen when technology failed or if the picture presented did not 'make sense'. He introduced RACON and situation of his VTS, together with the scope of its activities. He claimed that the work of VTS goes further than documentation would indicate and asked 'Is VTS a Big Brother or a careful mother?' In this context, he said that more use needs to be of public relations to promote VTS.

Remarking that training is struggling to keep up with advancing technology, he said that although this called for a change in attitude, at heart, operators are still human. He considered that marine experience is still an essential qualification, as the role of a VTS Operator can be seen as a crisis manager. He then added that 'everything turns around information and the challenge is how to deal with the increasing amount being delivered to the VTSO'.

Ko Goud then said that harmonisation, within IALA Recommendation V-103, is necessary world-wide and that IALA has an important role in assisting this process. In light of advances in technology, he also considered refresher training important. He ended by emphasising that in his view, VTS is not a big brother.

7.3 The Need for VTS Proactiveness in Maritime Disaster Readiness Training and Emergency Response Preparedness (F. Scott Humphrey, United States Coast Guard)

This was a presentation unaided by a slide show. It began with the recollection of the impact of receiving a telephone call concerning a collision between a fast ferry and a buoy, followed by news of many passengers in the cold waters of San Francisco harbour, before the revelation that this was, in fact, a risk scenario. Drawing on his example, Scott Humphrey said that, ashore, a VTS would be the first to hear of such an incident and is the most capable shore authority to deal with such a disaster. Having stated how national rules had developed with an ability to incorporate local situations he cited VMAP (Vessel Mutual Assistance Programme) as a way in which proactive VTS can be used, giving room for flexibility within less than proscriptive rules. He then said that there were those who would refer to this as VTS mission creep, alluding to participation in law enforcement as another example.

He concluded by asking all delegates to contact him with their ideas, so that, by sharing, information the ability of VTS can be developed.

7.4 An Initiative to Proficiency Testing in English Language (PELS) for VTS Operators (Presenters: Guus Leuveling Tjeenk and Siep Konijn NNVO (Dutch VTS Training Foundation))

The presentation began with an introduction to the NNVO Foundation and a 'setting of the scene' by Arne Walters, its managing director. Referring to ICAO, he said that a universal testing system for proficiency in English had just been implemented for air traffic controllers but this had taken 8-10 years to achieve. He then speculated about such a system for VTS Operators, adding that a pilot system was already in place in The Netherlands.

Guus Tjeenk then continued, beginning with a recording of a somewhat garbled communications exchange between a VTSO and a ship's officer, a text version of which was reproduced on the screen. Again referring to the air traffic control test, he covered the perceived need for a similar Proficiency in English Language test for VTS (PEL-VTS) and how the NNO pilot test had been developed. He mentioned the lack of initiative on this issue from IMO and way in which VTS could take a lead to implement it. He added that he hoped that IALA could find a home for the test within the scope of V103.

The structure of the PEL (VTS) test was described. The importance of plain language under stress and SMCP as much as possible was emphasised. This was followed by a description of the assessment process.

Summing up, Guus Tjeenk, suggested that:

1. One world-wide PEL test would be useful and would, ideally, consist of a series of tests, under the auspices of IALA.
2. Production of teaching material from VTSSs. That is, audio material needs to be collected, to enable VTSSOs to cope with different accents. This would be best done via IALA.
3. Overall, NNVO was looking for a symposium recommendation.

The presentation concluded with a short practical test, in which all delegates were invited to participate.

Questions and Answers

In response to a question on SIMAC's training involvement with AP Moller and the panel's view on training in NAS, Terry Hughes said that in training VTSSOs, each student was put into both ship and shore positions, with equipment failures and other distractions to cope with. This brought out the need for specific NAS training. This view was supported by SIMAC and said that their involvement with AP Moller was because the company runs a small number of VTSSs and so require their

VTSO's to be trained. Scott Humphrey added that pilots in San Francisco had to undergo VTS operations training and that this was clearly successful.

Jillian Carson-Jackson observed that there is an opportunity for the IALA VTS Committee to take the opportunity to provide input on VTSO qualifications to the current IMO review of STW Convention.

Jose Diaz said that the UK MCA tests the proficiency in English of officers in ships wanting to sail under the UK flag. Guus Tjeenk said that NNO were aware of the tests but had not researched them and that they were also aware of others, including in the Central European Framework. He then said that the key factor is lack of ambiguity, adding that IMO support for the use of descriptors would be a step forward.

Mike Toogood asked if VMAP had been put into practice. Scott Humphrey said that thankfully, this had not happened for real, but on several occasions it had been used in drills, most recently in the past month, and that this included multi-agency participation. These drills resulted in changes, showing how useful they were.

8 TECHNICAL SESSION 6 – VTS AND E-NAVIGATION

Chair: Bill Cairns, United States Coast Guard

8.1 e-VTS with a Comprehensive Look at the Barents Region (Presenter: Jarle Hauge, Norwegian Coastal Administration)

Jarle Hauge explained that, on an assignment from the national government, the Norwegian Coastal Administration (NCA) had established Vardø VTS during 2005-2007. The centre was became operational in 2007 and was, from a functional point of view, further developed later that year. Located in the Arctic environment, in the oldest town in Finnmark, Vardø VTS is well placed to witness the dynamic changes taking place in the maritime traffic pattern.

He then stated that the VTS system that has been developed is using the latest in sensor and computer technology. The most important element is the integration and utilisation of relevant vessel, voyage, cargo, safety and environmental information, found in national and international databases. This information framework at Vardø VTS presents a comprehensive and integrated maritime picture, available at the Operator's fingertips, and takes into account the EU directive 2002/59/EC, which introduces the SafeSeaNet system in European waters.

The presenter detailed the three core components that make up the VTS system and create the information framework. This consists of a conventional graphical vessel display (C-Scope) with tailor-made functionality based on the specification of the NCA; an Operator Support System (OSS) that has been developed to assist the operator in the day-to-day operation and decision making process and a Message Central, put into operation to integrate C-Scope, OSS and various sources of internal and external information services. Conceptually the design of the VTS system is based upon a Service Oriented Architecture (SOA), and the data format is based upon Extensible Markup Language (XML).

He concluded by saying that the system was performing satisfactorily and that the intention is to implement this VTS concept nationwide in Norway.

8.2 Embracing e-Navigation From the Shore to Enhance Navigational Safety, Communications and Efficiency (Presenter: Neil Trainor, Australian Maritime Safety Authority)

Neil Trainor started by recalling decisions made regarding e-Navigation, its definition and its proposed development through IALA and IMO. Although many inherent obstacles have been identified constraining the timely adoption of e-navigation aboard vessels, it is a concept that is rapidly being embraced ashore by VTS centres. He said that the close track monitoring capabilities provided by AIS to compliment positional sources such as radar and LRIT technologies, coupled with modern computer systems to integrate, analyse and present information to the VTSO, has significantly enhanced the ability to monitor ship traffic and developing situations from the shore and assist with on-board decision making.

He then described the experience gained by Australia with the introduction of e-Navigation concepts in a coastal VTS environment and how enhanced information is communicated with the mariner and allied services. He gave information on the use of electronic corridors to monitor the passage of individual vessels transiting the region relative to their proximity to recommended routes and waypoints and showed two examples where groundings were avoided using these electronic corridors.

Thanks to interface possibilities, the integrated system implemented provides coastal pilots companies with accurate ETA's of vessels to pilot boarding grounds to assist them to more efficiently task helicopters or pilot launches and subsequently minimise delays to a vessel's transit. The integration of positional data from

commercial fishing vessels had recently also be implemented, what provide information to assist on-board decision-making.

The presenter concluded by encouraging the adoption of e-navigation aboard vessels and also by saying that e-navigation has to be seen as a process of evolution hoping that it will only be in the positive sense for the benefit of maritime safety and protection of the marine environment.

8.3 Concept and Implementation of Coastal Intelligent Traffic System (CITS) (Presenter: Jin-Soo Park, Korea Maritime University)

The presenter started by a brief description of the VTS and AIS equipment all along the Korean coasts. He explained the difficulties in integrating different systems as they which come from different manufacturers with different specifications. It was decided to develop a new integrated system from the existing VTSs, supporting both the safety and security functions.

Jin-soo Park described how the Republic of Korea introduced a state of the art concept – Coastal Intelligence Traffic System (CITS) – in the southwest coastal waters of Korea for developing the new system, which includes standardization on functionality, on specifications and on exchange of information. He gave results and lessons learned from the trial system up-to-now and described the future plans of the regional VTM in Korean coastal waters incorporated with Radar, VMS, GICOMS and AIS networks.

New IT technologies will be used for the incorporation of the system to improve VTM performance and efficiency, and to share the information for the global/regional VTS level. These technologies comprise of new visual presentation techniques, new systems like AIS, fusion of digital data from various sensors, new techniques in information networks and new human reliability techniques.

8.4 e-Navigation and VTS: The Need for Decision Support (Presenter: Cormac Gebruers, TRANSAS Ltd.)

Cormac Gebruers started his presentation by saying that, step by step, VTSs have evolved with the development of technology and that the tasks requested by the staff are increasing. Furthermore, the e-Navigation Strategy identifies “Human Centred Presentation Needs” as an important user requirement, and states that “consideration should be given to the use of decision support systems in meeting this need”.

The solution to the increase of tasks is not to increase the VTS staff in providing more operators (too many cooks), which can be confusing, but to develop technology to offer decision support system. Indeed, in VTS, the number of vessels has increased, the information required has developed and now concerned not only vessels but other parties. Early intervention, planning reporting and other pressure come in addition add on the shoulders of the “decision alone operator”. The evolution from VTS to VTM, from tactical VTS to strategic VTS contribute also to the VTSSO pressure and it is necessary to assist the operator to decrease this pressure despite he/she receives always more information and he/she has more and more decision to take.

The presenter explained that to improve operator’s abilities, it is made use of a decision support system (DSS) to increase productivity and capability; for instance, by providing the operator with less information but higher level of information and by allocated to IT and human what each one do best. It is cost effective, but it is also both a technical challenge (turn dumb programmes into cognitive systems, teaming decision support system) and a social challenge (trust the system, liability, human resentment for technology).

In conclusion, the presenter suggested a roadmap to building actual decision support tools for e-Navigation enabled VTS systems.

Questions and Answers

A delegate expressed his satisfaction that the presenter insisted on the necessity to take into account social challenges such as the change tasks for the operator or the way to change the training accordingly. Cormac Gebruers replied that such evolution already appeared in other industries to adapt relationship between human and the tool used. Onboard ships, tasks have already changed dramatically but not all have realized that; it means that training is a real priority.

9 TECHNICAL SESSION 7 – VTS AND E-NAVIGATION

Chair: Bill Cairns, United States Coast Guard

9.1 A New VTS Facing to e-Navigation Age – How to Contribute to its Role (Presenter: Koichi Nishimura, TOKIMEC Inc., Japan)

The challenge facing national authorities is to make life at sea safe in one of the most congested sea areas in the world. There are seven VTS facilities in congested sea areas, including bays and channels of the country. TOKIMEC has served as the sole VTS manufacture for the national authority, and have delivered radars, operation consoles and servers which control the overall VTS system and AIS shore stations.

The emerging concept of e-navigation will have an impact on VTS and the interaction between VTS and mariners. e-Navigation would reduce navigational accidents, errors and failures by developing new VTS applications that would make a major contribution to national authority's task of safe and secure marine traffic.

The key factors concentrated on are AIS information of ships including non-SOLAS ships and improving performance of VTS radar.

Two elementary technologies are involved; (1) multi axis micro inertial sensor and (2) VTS radar using Ku band. Ku Band radar demonstrates significant advantage in detecting small ships over S or X Band.

An example of how radar will detect very small vessels in the congested area of Osaka Bay, clear of spurious echoes, was shown. The VTSO needs the heading and this can be sent to the VTS centre from a Class B AIS as well as the ship's position.

9.2 Reaching e-Navigation through Systems Integration (Presenter: Todd Robertson, Lockheed Martin, USA)

IMO and IALA have put forward an international initiative called 'e-Navigation' or 'e-NAV'. This concept is gaining momentum among government authorities, who see it as a potential means to accomplish and support their various missions that relate to maritime safety and maritime security. It is also receiving significant attention among various sectors of private industry that include the users, and providers, of the future e-NAV system.

Electronic systems have made great strides in the past few years, to make vital, real-time information and data available to various users in the maritime community, both afloat and ashore. E-Navigation concerns berth to berth navigation and the transfer of data between all interested stakeholders to facilitate this process. e-Navigation will also facilitate safety, security and environmental protection.

The differences between old and new technology were shown. Whereas the VTS Operator used to spend time setting up various radar parameters, new technology allows the VTSO to spend more time managing traffic. Some examples of systems using new technology were shown. These were; the US National VTS System (PAWSS), the Greek National VTMIS, the Turkish Straits VTMIS, the Egyptian SAR System, which updates the VTMIS and the Australia College of Kuwait (maritime simulation and training centre).

At the same time, from a systems integrator perspective, there are certain concerns, issues and potential pitfalls that should be considered as the e-Navigation initiative matures. It was shown how systems integration can contribute to the e-Navigation initiative, the mission-critical needs of authorities and benefit all stakeholders.

Looking at the future of e-Navigation, Todd Robertson stated that it would be web based with web enabled technologies using data feeds. There will be newer AIS based technologies, which are advancing all the time. There will be enhanced

ship/shore data exchange. In spite of all this, we must not forget the human machine interface.

9.3 Presentation Title: VTS in an e-Navigation Age: Navigation Assistance from Shore in the Near Future (Presenter: Hideki Kawasaki, Japan Coast Guard)

The presenter described several possible elements for e-Navigation, such as inexpensive communication means, AIS binary messages and virtual aids to navigation, followed by general discussions regarding the role of VTS in an e-Navigation age.

With respect to the e-Navigation concept, it is indispensable to utilize an inexpensive dual-mode communication service. The communication services now available or those soon to be available are compared leading to conclusions what media would be most promising and suitable from technical and economical points of view. Web support will soon be provided from coastal centres.

Binary messages and virtual aids to navigation as functions of AIS, which are thought to be the core elements of e-navigation, were discussed. Binary messages themselves were adopted at NAV49. Japan has devised some new binary messages and these will be proposed at NAV54.

In 2006, Japan Coast Guard carried out an evaluation of existing AIS. Areas like the Kurishima Straits, where the sea currents are constantly changing direction. The results of a survey including requests from the maritime community such as navigators and pilots, showed that certain issues needed to be solved.

The problems now being faced are; (1) performance limitations in broadcasting information by AIS, which could be solved by sending verbal messages via ENSS and (2) how to get the name of a vessel which is not required to carry AIS. This could be solved by utilising the radar signature ID technology.

9.4 Presentation Title: Enhancement of VTS Navigational Assistance Services to include Monitoring and Control of Under Keel Clearance (Presenter: Terry O'Brien, OMC International, Australia)

Recent developments in navigation technology make possible the monitoring and control of under keel clearance of large vessels by optimisation of vessel speed during transit along shallow waterways.

Safety levels are increased through the integration of Dynamic Under Keel Clearance (DUKC®) technology into VTS navigational assistance services. The new technology allows VTS operators and/or shore-based pilots to monitor that vessel speeds remain within the speed envelopes generated by the DUKC® Passage Plan prepared prior to sailing. It allows the effect of alternative speed/sailing options on under keel clearance to be quickly investigated in situations where the passage does not proceed as planned. These could include situations such as vessel breakdowns, vessel delayed leaving the berth, vessel loaded in excess of its planned passage draft, vessel not performing as expected or deterioration in the environmental conditions. The technology can also be used onboard by a pilot equipped with a light Portable Pilot Unit (PPU).

When devising the highly sophisticated algorithm the following items were taken into consideration; channel depth, survey tolerance, siltation, astronomical tide, tidal residue, draft, squat, heel and wave response.

DUKC® has assisted the planning of more than 35,000 ship transits over the past 15 years, without incident. It has increased safety while generating billions of dollars in increased cargo throughput. The accuracy of the numerical ship motion models used in the DUKC® system have been comprehensively tested against full-scale measurements conducted on more than 200 vessels of varied types, transiting a wide variety of waterways under diverse environmental conditions.

Examples were shown from Australia and Europe which illustrated that the integration of DUKC® into VTS and PPU systems for passage planning, monitoring and control of under keel clearance in port channels, rivers and coastal waterways has been successful.

In 2003, off Marsden Point in New Zealand, two groundings occurred. As a result of these groundings a survey was commissioned and DUKC® was successfully integrated. In another recent case a large bulk carrier ran aground due to steering failure. DUKC® was utilised and was able to support the VTS to get the vessel safely back to sea.

Questions and Answers

A question was posed to Hideki Kawasaki. The delegate appreciated that fishing fleets are a big problem with respect to safe navigation. Was it possible that if the fishermen knew that VTS was monitoring their progress, they would no longer keep a good look-out themselves, either visually or by radar? Hideki Kawasaki stated he was unsure of the answer.

In response to a question on costs (as the DUKC model is very complex, how does this affect costs), Dr O'Brien responded that a lot depended on the waterway concerned. Creating a 'fast time' model is very important but even so, the cost is very small compared, to the economic benefits derived.

10 TECHNICAL SESSION 8 – INNOVATIONS AND IMPROVEMENTS IN VTS OPERATIONS

Chair: Brian Tetreault, United States Coast Guard

10.1 Integration of Fisheries Sensor Data within the VTS Environment (Presenter: Kerrie Abercrombie, Australian Maritime Safety Authority)

The presentation began with a short video setting its fishery context, after which Kerrie Abercrombie said that collisions between commercial ships and fishing boats are the second largest contributor to incidents in the vicinity of the Great Barrier Reef.

It became clear that the statistics she quoted were starker when near misses were taken into account. Having shown the breakdown of the contributing factors, a sample of the reviews and enquiries that had recommended the embracing of Vessel Management Systems (VMS) was given, followed by a brief introduction of what VMS is.

Kerrie then explained the difficulties experienced in releasing the information derived to other authorities but this had resulted in the implementation of on-line access in mid-2007. Examples of the information derived from the use of the VMS were shown before the process by which the stakeholders were induced to join the system was described. Although the first equipments employed INMARSAT C, success is now being achieved with AIS Class B transponders, which are proving affordable, easy to fit and integrate with onboard equipment.

It was then reported that experience is showing that although the equipment can be switched off, as the users may require, it emerged that fisherman are trending to leave the equipment switched on and find its use beneficial.

A short video, showing onboard use was then shown before Kerrie briefly described the capabilities and limitations of the onboard equipment in use.

The summary indicated that there had been benefits for both ships and shore authorities.

10.2 Extreme Make - Over VTS Edition (Presenter: Katrijn De Maere, Maritime Services and Coast: Shipping Assistance, Belgium)

Katrijn De Maere began by likening what had been done to the two Flemish VTS, three Dutch and the River Control Station to what happens in a number of television programmes before setting the geographic context and describing the scale of the traffic that the VTS had to deal with. She then described how the Flemish and Dutch VTS on the River Scheldt were, effectively, one system.

Katrijn explained that what had looked a modern and integrated system in 1994 had begun to look cluttered and diverse by 2001 and that this had been the spur to action. This led to a detailed description of the scope of the enhancement project and the impact that this had on both fixtures and fittings, not to mention the efforts taken to meet the differing requirements and standards of two nations and cater for future proofing; all this whilst the VTSS continued working.

Turning to lessons learned, Katrijn's first comment was 'to expect the unexpected'. This was followed by catering for very differing requirements for lights, the need to place orders early, the key role played by health and safety, the importance of good communication in keeping everyone informed and the benefits to be derived from the active participation of contractors. She concluded by highlighting the need to keep within budget and was happy to say that the overall result had been well received by the VTSSO's and is working well.

10.3 Marine IT Technology for the Standardisation of Data Exchanges in VTS Systems (Presenter: Byeong-Deok Yea, Korea Maritime University)

Byeong-Deok Yea began by saying that he was happy to note that his topic fitted well with many of the issues raised in earlier presentations. He went on to sketch the background to his presentation by explaining the relationship in Korea between system operators and manufacturers, before speculating that it should be possible for system personnel to be able to add or exchange system components, in much the same way that a PC owner, who knows little about how it works, can do today. B Yea then quoted the problems encountered in persuading differing systems providers to open up their systems when data exchange between two adjacent VTSs was required, as another reason for his presentation. He then extended the potential scope of the challenges he envisaged needing to be overcome, by extending the scenario to include data exchange between different countries.

B Yea then described the current situation regarding maritime information in Korea, before discussing the need for standardisation in data exchange. This led to a brief description of the technical trends he detected in Korea, which centred mainly on the integration of information, before discussing data exchange issues in the context of IALA and Korea's near neighbour China.

Focussing on activities in Korea, the progress with standardisation of data exchange was covered, which led to an overview of the functional architecture being used and the problems that it was encountering and specification of the protocols being used for data exchange between VTS centres. This was followed by a number of examples of data exchange before B Yea concluded by briefly describing immediate future activities, in confirming the effectiveness of standardisation, applying newly developed IT concepts and technologies and data exchange between adjacent countries.

10.4 Augmenting VTS Surveillance Capabilities Through the Integration of Non-Conventional Marine Radar Systems (Presenter: Piero Pellizzari, Italian Coast Guard)

Piero Pellizzari began by outlining the role of the Italian Coast Guard's activities in VTS before describing how two operational requirements, the proper consideration of maritime security aspects and e-navigation and the regionalization of maritime traffic information & services are affecting the evolution of VTS operational requirements as well as extending their scope beyond control of vessel traffic. From this it emerged how data exchange is central to national, regional and European activities.

He described how various technologies are being integrated to produce an enhanced traffic image and how they are being used to produce co-operative traffic tracking in the Italian national VTS.

This was followed by the itemisation of anticipated advantages before going into greater detail of specification and capability of some of the specific technologies being employed; these included standard X/S-band radar network (including frequency diversity radars), Ka-band and different X-band radars and space-borne synthetic aperture radar.

The improvement in coastal radar performance was illustrated before Piero Pellizzari explained that one result of the current work had been to identify new data fusion requirements. He then covered a wide range of on-going activities, involving the radar technologies being integrated, participation in a number of EU sponsored research projects and new extraction, tracking and data fusion techniques.

Questions and Answers

In clarifying a statement made in the first presentation about VMS, a delegate remarked that it was not true that Class B AIS transponders were invisible to Class

A AIS transponders. Some limited information about them was available to Class A AIS transponders.

11 TECHNICAL SESSION 9 – INNOVATIONS AND IMPROVEMENTS IN VTS OPERATIONS

Chair: Brian Tetreault, United States Coast Guard

11.1 Next Generation Systems for Aiding Coastal VTS Operators (Presenter: Einar Lihovd, Kongsberg Norcontrol IT)

This presentation highlighted some of the VTS-related R&D activities that Kongsberg Norcontrol IT has been focusing on for the last 3 years. There are 2 main objectives for the research:

1. Enhancing the traffic image through the use of specialised services
2. Exploring new ideas to aid VTS Operators by the use of advanced decision support systems.

There are new types of tracking sensors:

- LRR/LRIT;
- Space based AIS;
- Fishing Vessel tracking and reporting system;
- Ship detection using sat based SAR (Synthetic Aperture Radar) – KSAT.

The specialised services mentioned include;

- Calculating dynamic risk values per vessel;
- Regional Weather
- Oil spill detection based on SAR/SLAR;
- Drift Simulation tools.

The overall idea is to process the information available to a modern coastal VTS using portable units and server units and use new ways of presenting the results to effectively support the VTS Operators during situations that could lead to critical events.

With respect to Maritime Operation Services (MOS), MarNIS is proposing that;

- At a MOS Centre all services are at the same location;
- The MOS Operator be able to handle all the services;
- The MOS system be capable of helping the MOS operator.

To summarise, Coastal/Regional VTS requires;

- Additional types of sensors;
- Must provide decision support tools;
- More effective ways of organising MOS services;
- Easy sharing of information from VTS to external users.

The R and D activities described have been performed as part of MarNIS (EU research project within the 6th framework programme) and national R&D projects like 3D Attention Zone and eFarled.

11.2 Applying VTS Operational Principles to Achieve Maritime Domain Awareness on Inland River Systems (Presenter: Burt Lahn, United States Coast Guard)

Tracking barges carrying Certain Dangerous Cargo (CDC) on the United States inland river waterway system presents challenges and obstacles not normally encountered in the port, harbour or coastal domain. While AIS, cameras and radar are the most prevalent sensors in port and coastal VTS, they cannot be applied as

readily in an inland river system. Limited or non-existent shore side infrastructure on this expansive waterway system required innovation and flexibility. For both safety and security reasons, the US Coast Guard researched, developed and implemented a tracking system to provide complete visibility of those CDC laden barges that posed the greatest risk.

The presentation showed several pictures of barge movements on the inland waterway system and summarised the setting up of the original IRVMC (Inland River Vessel Movement Centre) in St Louis Missouri.

The presentation also described a process that imposes minimal burden on the mariner, and still enables the Coast Guard's IRVMC and other shore-side authorities to effectively monitor the movements of CDC laden barges on over 10,500 miles of the US inland river system.

The Inland Rivers Vessel Movement Centre (IRVMC) supports Coast Guard Captains of the Port and the Maritime Industry by providing accurate and timely information necessary to detect, deter, and prevent terrorist attacks on the inland rivers of the United States. The Standard Operating Procedures provide direction and guidance to personnel on watch standing expectations and relationships with other local Coast Guard Commands.

11.3 AIS and Vessel Traffic Management and Information systems (Presenter Jon Leon Ervik, Norwegian Coastal Administration)

In 2002, Norway started to extend the shore-based AIS system. At the same time, it was a goal to focus on the use of AIS information for several purposes. Some of the first users were the MRCC centres and integration of AIS information in the SAR application.

From 2002 until today, this system has been fundamental in the development of a web based AIS online information system. The construction of the 36 base stations was completed in 2004.

Through close co-operation between official and private organizations, the web system provides a lot of opportunities and benefits for over 200 stakeholders. Customs, fishery authorities, pilots, security (ISPS), Navy, MRCC, maritime safety authorities, Ports, PSC authorities and VTS centres, are some of the AIS online users today.

For VTS authorities, AIS online is a good tool in planning and operational activities. Information from the AIS online system can also be combined with different layovers and different charts, as well as connects to different information sources, and generate statistics, met / hydro information, RISK analyses and decision making tools.

The system has several functions, among them being: single vessel selection, adding a weather forecast layer, being able to change the type of map used, adding a satellite image layer and creating statistics. The system can be used for traffic planning and risk analysis purposes and can be customised to suit individual stakeholder requirements. Filters can be applied and alerts can be provide using email or by Google.

The presenter concluded by saying that IALA could be an international co-ordinator of AIS information.

11.4 Presentation Title: New, Emerging, Radar Technologies (Presenter: Jens Pedersen, TERMA AS)

Solid state radar has been a buzzword for quite some time and air traffic control radars does employ solid state techniques. The arguments in favour of solid state include extended service intervals, improved utilisation of frequency spectrum and improved reliability. However, solid state did not penetrate to VTS, Coastal Surveillance and ships navigational radar, for technical and economical reasons.

For ships navigation the limitation is also that radar beacons will not be as visible or not seen at all, due to the techniques employed.

Providers of mobile telephone services have demonstrated that frequency spectrum is worth a lot of money and spectrum pricing (payment for occupied bandwidth) for radars is also becoming the subject of discussion, and solid state has been mentioned as a possible cost saver in respect to that.

Especially for VTS and Coastal Surveillance the situation is complex. Requirements to dynamic characteristics, resolution, clutter processing and interference suppression make it very challenging to employ solid state radar technology in an economically feasible way. Methods from the Defence and Air Traffic control markets may be modified, but unfortunately the technology is subject to arms trade restrictions.

Furthermore, current solid state technology has low efficiency, and improving reliability may not be as simple as it sounds due to the fact that the transmitter circuits operate with very high junction temperatures.

Despite these difficulties, solid radars will emerge, also for Ship Navigation, VTS and Coastal Surveillance, as transmitter, receiver and associated processing techniques mature.

11.5 Application of AIS in Yanshan VTS (Presenter: He Genlin, Shanghai MSA)

The East China Sea AIS Shore-based Network and Yangshan VTS share resources. This presentation introduced the construction of both systems and the development of AIS application in Yangshan VTS, and then discussed the East China Sea AIS Shore-based Network AIS application in Yangshan VTS and its network structure.

Application of the East China Sea AIS network in the Yangshan VTS mainly includes:

- AIS information broadcasting;
- AIS alarms;
- Vessel grouping;
- AIS history track.

The mainly problem of AIS application in Yangshan VTS is: the inaccuracy of AIS information which is put out by vessel.

China MSA is considering connecting the China AIS network data to all VTS Centres in China. In principle, VTS would not construct any more AIS shore stations but just consider the AIS interface and access to China AIS network.

In conclusion the East China Sea AIS Shore-based Network allows the AIS information to be shared. VTS also benefits by more efficient traffic monitoring.

11.6 Virtual E-Chart on the Lower Mississippi River (Presenter: Mike Sollosi on behalf of Douglas Grubbs, Crescent River Ports Pilots Association, US)

The Virtual Buoy Inland Electronic Navigational Chart (Mini-IENC) is specifically designed for special inland navigation circumstances narrow, close-in waterways and special navigational hazards. It has a reduced number of features and focuses on those areas crucial to navigating specific hazardous situations.

It was developed in response to a navigation problem faced by an ultra large cruise ship "Carnival Conquest" required to transit under low hanging power lines located in a slight bend on the Lower Mississippi River, immediately upriver of a tanker dock. The catenary of the power lines severely limited the vessel's horizontal manoeuvring space. Varying river stages and strong currents added additional

navigational complications. The transit always occurred at night in all weather conditions.

The Mini-IENC shows the impassable area with virtual danger buoys. The representative ship length established turning points by adding situational awareness of pivot points of the ship. These distance features enabled the ship's bow to pass inward of the safe passage areas, slightly straying into the restricted area. As the ship swung about its pivot point, the forward radar mast and aft funnel could be made to swing out into the safe passage area to avoid hitting the power lines.

The presentation showed pictures of the charted area together with photographs of the cruise ship in transit.

Questions and Answers

A delegate asked if there ought to be a separate chapter in the next edition of the IALA VTS Manual on MOS. M Sollosi said that this would be considered when the manual is next reviewed and updated. A comment was then made that MarNIS is a research project and MOS is a concept within it. More work needs to be done in this area before any final decisions are made as to how a MOS will be operated.

12 TECHNICAL SESSION 10 – VTS – AN ARCTIC PERSPECTIVE

Chair: Sanna Sonninen, Finnish Maritime Administration

12.1 The Benefits of VTMS and Real Time Information Systems in the Arctic and Other Environmentally Sensitive Areas (Presenter: Arild Loeve, Kongsberg)

The presenter talked about how an extended VTMS, with additional responsibilities for the VTS Operators, which include environmental surveillance and reporting, oil spill monitoring, as well as SAR coordination, should be able to ease both public concerns and potential risks to the environment.

In addition to typical VTS sensors like radar, AIS, VHF-DX, the VTMS will collect meteorological/hydrological, satellite and other environmental data as well as underwater surveillance sensors. The extended VTMS will provide a common recognized situation awareness picture from a combined set of sensors. In case of events like oil spills, groundings, collisions or other threats to offshore installations, the extended VTMS will help the decision makers.

In the Arctic and other environmentally sensitive areas around the world, there will always be conflicts of interest between commercial activities and environmental considerations. Governments, politicians and environmentalists, and the general public, must be reassured that the environmental issues are addressed, and that risks will be minimized through the utilization of the best available technologies.

The Arctic covers a very large area, which has specific challenges, namely:

- Climate and seasonal variations;
- Vulnerable natural resources;
- Key economical activities such as fisheries, oil and gas;
- Extensive ship traffic.

The focus on environmental issues related to oil and gas activities in the Barents Sea is directed at:

- No discharges to the sea from petroleum activities during normal operations;
- Energy consumption – energy sources – emissions to air;
- Quality of environmental data (time and accuracy);
- Environmental monitoring (fisheries, birds, etc);
- Stakeholder communication;
- Accidental discharges to the sea – enhanced oil spill related emergency preparedness.

The simulation and training centre plays a big part in enhancing the effectiveness and efficiency of personnel. Various scenarios can be simulated such as:

- Oil spill simulation;
- Simulation infrastructure for scenario generation;
- Environment models for natural resources;
- Models for met and oceanography;
- Sensor models;
- Communication models;
- Recording/Replay, statistical analysis.

To summarise, the benefits of having an enhanced VTMS are:

- Early detection of potential threats to the environment – time to react;
- Improved safety for personnel and installations offshore;
- Distribution of a common recognised picture - in real time;
- Better coordination and decisions in critical situations;
- Simulation and Training Centre – a key to success.

12.2 Arctic Climate and Shipping: Present and Future Perspectives (Presenter: Ola Johannessen, Nansen Environmental and Remote Sensing Centre, Bergen)

The presenter talked about global warming and how the Arctic area is changing. As a result of this together with an increase in CO₂ emissions, sea levels are predicted to rise. Natural variability and greenhouse warming in the Arctic will impact on:

- Atmospheric temperature;
- Ice changes;
- Impact on Northern Sea Routes.

There is a correlation between CO₂ and ice extent. Statistics show that there is a 90% decrease in ice cover relating directly to an increase in CO₂ emissions.

In conclusion SAR is very useful for Sea Ice Navigation:

- Ice covered sailing routes are covered by SAR data;
- SAR data can be received on-board in near real time;
- SAR ice information can increase the general speed of the convoy in pack ice by a factor of 2;
- Operations in the Arctic require routine use of SAR data as a key data source for ice information;
- SAR data is today routinely available from the Nansen Centre St. Petersburg SAR server.

The challenge is implementing a sustained atmosphere-ice-ocean and ecosystem monitoring and forecasting system in the Nordic Sea and the Arctic Ocean during the IPY period in parallel with improved modelling and evaluation for advancing climate predictions for the Arctic regions for the 21st century.

If the predictions turn out to be valid, then global warming will have a strong impact on the ecosystem and fisheries, living conditions for humans and animals, offshore and onshore oil and gas exploration and production, ship transportation along the Northern Sea Route and North West Passage, on society, economy and energy supply.

12.3 Traffic Management Systems for the Arctic Areas – Service Requirements and Environmental Considerations (Presenter: Jorma Rytönen, Kymenlaakso University of Applied Sciences / Maritime and Logistics, Finland)

The main factors affecting Traffic Management selection are:

- Low traffic density in the area;
- Ships classified to sail in arctic/Polar ice conditions;
- Huge area with a determined number of ports and terminals;
- Regularly offered services of VTS/VTMIS areas not useful here;
- Legislative differences, rules and regulations.

Climate changes in the Arctic will have an impact in many areas. Reduced sea ice is very likely to increase marine transport and access to resources. The navigation season will be lengthened. Seasonal opening of the NSR is likely to make Trans-Arctic shipping during summer feasible within several decades. Reduced sea ice is likely to allow increased offshore extraction of oil and gas.

Sovereignty, security and safety issues as well as social, cultural and environmental concerns are likely to arise as marine access increases. We will need to be more mindful with such things as antiterrorism, management of the international supply chain, cargo tracking and identification and environmental protection.

As the navigation season increases there may well be a need for Ice Pilots. Their goal will be to assist shipmasters on vessels navigating in ice conditions with the aim of ensuring the safest and most efficient route to the port of destination. The ice pilots would recommend both strategic and tactical routing. Navigators themselves should be pilots and shipmasters on icebreakers, and they must have a long history in the field and extensive experience in winter navigation. The ability to predict the movement of ice and to choose the safest routes is based on access to the latest ice and weather information. Ice advisors are armed with the best sources of information on the ice conditions and long term experience in winter navigation. They will have access to satellite images, and real time information on ice conditions.

The focus is changing with respect to the future of research and development. The following list shows where this will be directed:

- Efficiency (costs and benefit)
- Safety
- Security
- Environmental protection
- Contingency planning
- Navigational planning
- Vessel management
- Cargo management
- Law and rules enforcement
- Remote guidance of vessels
- Potential of current and future ice monitoring by satellites and enhancement opportunities by networking of services
- Enhancement of onboard equipment

12.4 Presentation Title: Emerging Challenges in the Arctic (Presenter: Mike Sollosi, United States Coast Guard)

Everywhere there is water, there is a need for some level of navigation services and now, there is water where there didn't used to be. There are emerging challenges in the Arctic. A major concern is the ability to be able to launch a major search and rescue operation is anything happens to a cruise liner or cargo vessel. There is an increase in both the cruise liner and bulk carrier trades.

Changing environmental conditions and advances in technology are expanding activity in the Arctic region, as potential access to new energy reserves and more efficient shipping routes fuel demand. Continued growth in commerce, ecotourism, and exploratory activities in the Arctic is increasing risk to mariners and ecosystems and creating demand for operational competencies and capabilities. The need for navigation, lifesaving, environmental response services as well as a law enforcement presence is required there now, and this need will only increase with time. From a waterways management perspective three possible sea routes converge in the Bering Strait. SOLAS Chapter V highlights some important items, which need to be looked at, namely:

- V-9 Hydrographic Services;

- V-10 Ships' Routeing;
- V-11 Ship Reporting Systems;
- V-12 Vessel Traffic Services;
- V-13 Aids to Navigation.

It is recommended that the following process be followed:

- Traffic study - Characterise the existing fleet and traffic and the quantities of hazardous cargoes moved. Project growth in trade, changes in vessels, and impacts of expected regulatory changes. Project the fleet makeup over a 25-year study period.
- Spill baseline study - Develop an oil spill baseline over the study period, using projected movements of oil and hazardous materials and estimated spill rates and frequencies. The projection should provide an understanding of the most important hazards and serve as a baseline for later assessment of benefits.
- Identification of high-risk accidents - Identify the hazardous substances, representative spill sizes, and locations of spills associated with the highest-risk accidents.
- Phase A consequence analysis - For representative high-risk accidents, perform a high-level spill trajectory and fate analysis to gain an understanding of the relative impacts of spill size, type, and location.
- Accident scenario and causality study - Determine representative accident scenarios to develop probabilities for their principal causes and associated consequences.

12.5 Russian-Norwegian cooperation on Barents VTMIS (Presenter: John Erik Hagen, on behalf of Kristen Selvig, Ministry of Fisheries and Coastal Affairs, Norway)

This presentation highlighted some vital requirements for the Vessel Traffic Services for the Arctic areas. Focus has been paid for information, navigational assistance and traffic management services with the co-operation needed with other support services. The low traffic density in the area, ice conditions, and the huge area makes it challenging to consider regularly used services in conventional VTS/VTMIS areas. Discussion is also carried out on the suitability of modern Risk Control Options and VTS services to enhance the maritime safety and environmental protection.

The Arctic has a cold climate but is a very hot topic. Why is there an increased focus on the Arctic? The answer lies with petroleum resources, rich fisheries, climate change and new transport corridors.

There are many challenges for the coastal states and for the shipping industry. There is a cold climate, darkness, lack of infrastructure, an increased transport related to exploitation of petroleum resources and climate change, environmental challenges, oil spill preparedness and technology. There is an important need for knowledge and the monitoring of data.

IMO will have an important role to play. The first steps to be taken are the preparation of Guidelines for ships operating in Arctic Ice-Covered Waters (MSC/Circ.1056/MEPC/Circ.399). There will be new NAVAREAs in the Arctic (IHO/IMO/WMO). There could well be a role for IALA.

There are also some circumpolar interests involving the USA, Russia, Canada, Denmark and Norway. A regional VTMIS will need to be considered.

There of course will be many national priorities. There will need to be maritime safety around the waters of Svalbard (Spitsbergen). There will need to be more and better surveillance and tracking data.

The key points for this presentation are:

- The legal framework for the Arctic is there (UNCLOS)
- Development of regulations and policies through international and regional cooperation
- More knowledge and technology development is needed as basis for policy development - a role for IALA?
- Surveillance will be a key factor.

12.6 Clarification about IALA NET

Jean Charles Leclair of IALA presented some amplifying information on the aim and purpose of IALA NET. The information paper, along with the slides, is available at the VTS 2008 symposium website (www.vts2008.info).

13 TECHNICAL TOUR TO FEDJE VTS

On Thursday, 7 August 2008, delegates visited the Fedje VTS. Kongsberg sponsored this event, including travel (by a high speed craft) and lunch. Delegates were welcomed by the Fedje community at the community house, tasted local food, and also visited the new NCA pilot vessel.

Delegates were also able to see some of the tall ships in the area.

14 CLOSING SESSION

Chair: IALA Secretary General, Torsten Kruuse

The Secretary-General thanked the Conference Chairman for his over view of the previous day. He expressed his thanks for the Festive Dinner the previous evening, which the delegates warmly applauded. Turning to business, he asked Mahesh Alimanchandi to speak about conference dissemination information before introducing the conclusions and recommendations of the symposium. The report will remain in draft form until the end of the month (August)

14.1 Conclusions and Recommendations of the Symposium

Mahesh Alimanchandi explained that the document being reviewed had been compiled from the thoughts of the session chairmen and the organising committee. He then ran through the draft conclusions, one by one, taking comments from delegates and revising the displayed text. The finalised conclusions and recommendations will be incorporated in a revised report and posted on the Symposium website.

14.2 2012 IALA VTS Symposium – Presentation by Turkey

The text of the introduction by Captain Salih Orakci is at Annex 6. It concluded with a video introducing Istanbul and Captain Orakci's hope to see everyone there in 2012.

The Secretary-General expressed his thanks for such a warm invitation and said that planning would now get underway.

14.3 2010 IALA Conference – Presentation by South Africa

David Gordon of Transnet began his introduction with a short video about Transnet. He then congratulated all involved in the Symposium's organisation. He stressed the importance of IALA's role in maritime safety and South Africa's support for its aims. He introduced the forthcoming Conference, saying that many of the topics covered in the Symposium would be carried forward. He painted an attractive picture of the country and venue and then concluded with another short video covering the attractions of South Africa and, in particular, Cape Town.

The Secretary-General thanked David for his introduction to the 2010 Conference and added his wish that the delegates would be there.

15 THANKS FROM IALA AND CLOSING OF THE SYMPOSIUM

The Secretary-General thanked the delegates for their attendance and explained why the dates had been chosen. He expressed specific thanks to Kirsti Slotsvig (Director General of the Norwegian Coastal Administration) and Jon Erik Hagen (Conference Director), giving a small presentation to each. He then thanked the IALA President and Secretariat, the delegates and exhibitors and wished everyone a safe journey home.

Jon Erik Hagen then called forward and introduced his organising committee and then the IALA Secretariat, thanking each of them and presenting tokens of his appreciation.

The Symposium closed with the unfurling of a banner and a rousing farewell to all the delegates.

Annex 1: Final Programme

Day 1 – Monday, August 4, 2008

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
0830 - 1100	Registration / welcome tea and coffee <i>(Registration desk also open on Sunday 3 Aug from 1730 to 2000 hrs)</i>		
1100-1230 (90 minutes)	Opening of the Seminar		John Erik Hagen, Conference Director, NCA
	Welcome from hosts (Norwegian Coastal Administration (NCA))	John Erik Hagen, Conference Director, NCA	
	Welcome from IALA	IALA President, Liu Gongchen	
	Opening of Symposium	Helga Pedersen, Minister for Fisheries and Coastal Affairs, Norway	
	Keynote Address	Johan Franson IMO Council Chairman	
	Administrative Details		
	Opening of Exhibition		
	OFFICIAL PHOTO <i>(Venue – exhibition area. Delegates assemble 'loosely' and photo taken from a balcony at a higher level).</i>		
1230-1400	Lunch		
1400-1530 (90 minutes)	<u>Technical Session 1 – VTS – Its Role in Global Traffic Monitoring</u>		
1400-1420	Strategic Use of VTS	Brian Tetreault, USCG	Mike Sollosi, USCG
1420-1440	VTS in China – Achievements and Development	Zhen Song, China MSA	
1440-1500	VTS and LRIT - Role in Global Traffic Monitoring	Paul Morter, TRANSAS Telematics Ltd.	
1500-1530	IALA NET – Maritime Safety Benefits of a Global Data Sharing Network	George McCarthy, US Navy and Jacob Bang, DaMSA, Denmark	
	Overview of session and Q and A		
1545-1615	Refreshment Break		
1615-1700	Time to view exhibition		
1700	End of day		

Welcome Reception (for delegates and accompanying persons)

(Beverages and finger food will be served)

Venue: Radisson SAS Royal Hotel

Time: 1800 - 1930 hrs.

Dress Code: Smart Casual

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
0815-0900	Welcome tea / coffee		
0900-1030 (90 minutes)	<u>Technical Session 2 – VTS – Its Role in Global Traffic Monitoring</u>		Mike Sollosi, USCG
0900-0920	Integrated Use of New Monitoring Concepts Including LRIT	John Erik Hagen, Norwegian Coastal Administration	
0920-0940	Development of VTMISS System for the Gulf of Finland	Kari Kosonen, Finnish Maritime Administration	
0940-1000	The New Global Transparency – A Shipowners View of Tracking, Communication and e-Navigation Systems	Peter Hinchliffe, International Chamber of Shipping	
1000-1020	Responses to the Expanding Role of VTS and Future Vision	Hideki Kawasaki, Japan Coast Guard	
	Overview of session and Q and A		
1030-1100	Refreshment Break		
1100-1230 (90 minutes)	<u>Technical Session 3 – On-going Legal Issues</u>		Jillian Carson-Jackson, AMSA
1100-1120	The role of VTS in Law Enforcement	Tuncay Cehreli, Directorate General of Coastal Safety, Turkey	Vice Chair - John Erik Hagen, NCA
1120-1140	Legal Implications of Sharing Vessel Traffic Information	Jillian Carson-Jackson, Australian Maritime Safety Authority	
1140-1200	Legal implications of AIS	Jorge Arroyo, USCG	
1200-1220	Vessel Traffic Management in Europe	Marten Koopmans, European Commission	
	Overview of session and Q and A		
1230-1400	Lunch		
1400 -1530 (90 minutes)	<u>Technical Session 4 – Recruitment and Professional Competency</u>		Terry Hughes, UK
1400-1420	Development of VTS Operator Work, Working Environment and Tools for Decision Making	Sanna Sonninen, Finnish Maritime Administration	Vice Chair - John Erik Hagen, NCA
1420-1440	Is the VTS Solely an Aid to Navigation, or is it Something More?	Terry Hughes, UK	
1440-1510	TRANSAS View on IALA Recommendations for full-mission simulators	Holger Ericsson, TRANSAS Ltd.	
1510-1530	VTS Training Free-Style: The Spanish Experience	Jose M Diaz Perez SASEMAR / CENTRO JOVELLANOS, Spain	
	Overview of session and Q and A		

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
1530-1600	Refreshment break		
1600-1730 (90 minutes)	<u>Technical Session 5 – Recruitment and Professional Competency</u>		Terry Hughes, UK
1600-1620	VTS Training for Great Belt in Demark – training by SIMAC	Jorgen Brandt, Great Belt VTS, Denmark and Poul Vibsig Pedersen, SIMAC, Denmark	
1620-1640	Technology Never Ends; What About VTS Operators?	Ko Goud, RACON	
1640-1700	The Need for Vessel Traffic Service Proactiveness in Maritime Disaster Readiness Training and Emergency Response Preparedness	F.Scott Humphrey, VTS San Francisco, USCG	
1700-1720	An Initiative to Proficiency Testing in English Language for VTS operators, PEL(VTS)	Guus Leuveling Tjeenk and Siep Konijn NNVO (Dutch VTS Training Foundation)	
	Overview of session and Q and A		
1730	End of day		

Symposium Dinner

Venue: **At Mount Floien** (Access by Cable Car)

Time: **Meet at Cable Car Station at 1900 hrs**

(Please note that the cable car will also be used by the general public. In order to ensure that you get to the dinner venue on time, please arrive at the cable car station promptly at 1900 hrs. Thank you)

Dress Code: Smart Casual

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
0815-0900	Welcome tea / coffee		
0900-1030 (90 minutes)	<u>Technical Session 6 – VTS and e-Navigation</u>		
0900-0920	e-VTS with a Comprehensive Look at the Barents Region	Jarle Hauge, Norwegian Coastal Administration	Bill Cairns, USCG
0920-0940	Embracing e-Navigation From the Shore to Enhance Navigational Safety, Communications and Efficiency	Neil Trainor, Australian Maritime Safety Authority	
0940-1000	Concept and Implementation of Coastal Intelligent Traffic System (CITS)	Jin-soo Park, Korea Maritime University	
1000-1020	e-Navigation and VTS: The Need for Decision Support	Cormac Gebruers, TRANSAS Ltd.	
	Overview of session, followed by Q and A		
1030 – 1100	Refreshment Break		
1100-1230 (90 minutes)	<u>Technical Session 7 – VTS and e-Navigation</u>		
			Bill Cairns, USCG
1100-1120	A New VTS Facing to e-Navigation Age – How to Contribute to its Role	Koichi Nishimura TOKIMEC Inc., Japan	
1120-1140	Reaching e-Navigation Through Systems Integration	Todd Robertson, Lockheed Martin, USA	
1140-1200	VTS in an e-Navigation Age: Navigation Assistance from Shore in the Near Future	Hideki Kawasaki, Japan Coast Guard	
1200-1220	Enhancement of VTS Navigational Assistance Services to include Monitoring and Control of Under Keel Clearance	Terry O'Brien, OMC International, Australia	
	Overview of session, followed by Q and A		
1230-1400	Lunch		
1400-1530 (90 minutes)	<u>Technical Session 8 – Innovations and Improvements in VTS Operations</u>		Brian Tetrault, USCG
1400-1420	Integration of Fisheries Sensor Data within the VTS environment	Kerrie Abercrombie, Australian Maritime Safety Authority	
1420-1440	Extreme Make-Over VTS Edition	Katrijn De Maere, Maritime Services and Coast: Shipping Assistance, Belgium	
1440-1500	Marine IT Technology for the Standardisation of Data Exchanges in VTS Systems	Byeong-Deok Yea, Korea Maritime University	
1500-1520	Augmenting VTS Surveillance Capabilities Through the Integration of Non Conventional Marine Radar Systems	Piero Pellizzari, Italian Coast Guard	

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
	Overview of session, followed by Q and A		
1530-1600	Refreshment Break		
1600-1730 (90 minutes)	<u>Technical Session 9 – Innovations and Improvements in VTS Operations (six presentations)</u>		Brian Tetrault, USCG
1600-1620	Next Generation Systems for Aiding Coastal VTS Operators	Einar Lihovd, Kongsberg Norcontrol IT	
1620-1640	Applying VTS Operational Principles to Achieve Maritime Domain Awareness on Inland River Systems	Burt Lahn, USCG	
1640-1700	AIS and Vessel Traffic Management and Information Systems	Jon Leon Ervik, Norwegian Coastal Administration	
1700-1720	New, Emerging, Radar Technologies	Jens Pedersen, TERMA AS	
1720-1740	Application of AIS in Yanshan VTS	He Genlin, Shanghai MSA	
1740-1800	Virtual E-Chart on the Lower Mississippi River	Douglas Grubbs, Crescent River Ports Pilots Association, US	
	Overview of session, followed by Q and A		

Industrial Members Evening

Venue: Coastal Steamer Express Lounge

Time: 2000 hrs

Dress Code: Smart Casual

Day 4 – Thursday, August 7, 2008

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
0815-0900	Welcome tea / coffee		
0900-1030 (90 minutes)	<u>Technical Session 10 – VTS – An Arctic Perspective</u>		
0900-0920	The Benefits of VTMS and Real Time Information Systems in the Arctic and Other Environmentally Sensitive Areas	Arild Løever, Kongsberg	Sanna Sonninen, Finnish Maritime Administration
0920-0940	Russian-Norwegian Cooperation on Barents VTMS	Kristen Selvig, Ministry of Fisheries and Coastal Affairs, Norway	
0940-1000	Arctic Climate and Shipping: Present and Future Perspectives	Ola M. Johannessen, Nansen Environmental and Remote Sensing Center, Bergen, Norway	
1000-1020	Traffic Management Systems for the Arctic Seas – Service Requirements and Environmental Conditions	Jorma Rytönen, Kymenlaakso University of Applied Sciences, Finland	
1020-1040	Emerging Challenges in the Arctic Overview of session and Q and A	Mike Sollosi, USCG	
1050-1120	Refreshment break and Closing of Exhibition		
1120 Depart Venue	<u>VISIT to FEDJE VTS</u> KONGSEBERG SPONSORED EVENT <u>Bus transport provided from Grieg Hall to High Speed Craft (HSC) boarding point</u> (Delegates only please, no accompanying persons)		
	HSC Transport (lunch on board)		
1700	Return from VTS visit		

Festive Dinner

Venue: Grieg Hall, Exhibition Area.

Time: 1930 hrs

Dress Code: Lounge Suit (No Black Tie)

Day 5 – Friday, August 8, 2008

<u>Time</u>	<u>Activity</u>	<u>Presenter</u>	<u>Chair</u>
0815-0900	Welcome tea and coffee <i>Draft report available at registration desk</i>		
0900-1030 (90 minutes)	Conclusions and Recommendations of the Symposium	Mahesh Alimchandani, IALA	Torsten Kruuse, IALA
	2012 IALA VTS Symposium - Presentation	Capt Salih Orakci, Directorate General of Coastal Safety, Turkey	
	2010 IALA Conference - Presentation	South Africa	
	Thanks from IALA		
	Closing of the Symposium	J E Hagen, Norwegian Coastal Administration	

Coffee break and close of Symposium

Annex 2: List of Exhibitors

Exhibitor	Stand number(s)
Aanderaa Data Instruments	9
Atlas Elektronik Gmbh	17
Barco	15
Denbridge Marine	23
Easat Antennas Ltd	26
Frequentis Ag	18
Gem Elettronica Srl	14
Hitt Traffic	3– 4
Australian Maritime Systems and Japan Radio Company	29 – 30
Jeppesen Marine	25
Kelvin Hughes	2
Kongsberg	7– 8
Ledwood Technology	E
Lockheed Martin	27– 28
OMC International	16
Pharos Marine /Automatic Power	10–11
PLATH GmbH	D
Saab Transponder Tech AB	1
Schnoor Industrieelektronik Gmbh	C
Selex Sistemi Integrati	19 – 20
Sofrelog	5 – 6
Terma A/S	24
Transas Limited	21– 22
Transnet National Ports	A – B
VisSim AS	F
Zeni Lite /Navielektro	12 – 13

Annex 3: Speech by Liu Gongchen, IALA President

Your Excellency Helgen Pederson, the Minister for Fisheries and Coastal Affairs, Respected Mr. John Erik Hagen the Conference Director, Mr. Johan Franson, the Council Chairman of IMO, Mr. Torsten Kruuse, the Secretary General of IALA, Dear friends and Colleagues, Ladies and Gentlemen.

Good morning.

It is my great pleasure to be here at Bergen to attend the 11th International Symposium on Vessel Traffic Services. This symposium is an important event among the international activities of IALA. We are very pleased to see VTS experts, scholars, operators, managers and manufacturers from the world gathering here to discuss VTS' today and tomorrow, which will further promote the development of global VTS, and also contribute to navigation safety and maritime environment protection.

The early shore based radar system was installed for marine navigation service in late 1940s. In the 60s, as computer technology advanced, the system was added with the functions of radar data processing and traffic data-processing functions. For the past sixty years, through great efforts, the system has changed from a simple analog radar system to a comprehensive and integrated aid to navigation system incorporated with electronic nautical chart, GPS, AIS, VHF, ARPA, CCTV and so on. The application of VTS has greatly enhanced the efficiency of marine navigation, saved hundreds of thousands of lives. The progress of VTS has brought real benefits for navigation safety. When discussing VTS, we should not only pay attention to what we have done, but also to its future development and global standardization.

e-Navigation is one of hot topics within marine navigation-related international organizations, such as IMO, IALA and IHO. It will be a milestone in the history of the world marine navigation. The realization of e-Navigation will play very important role in maritime activities.

VTS is a vital component of e-Navigation, which needs further development in its management, operation and technology. With the extensive application of computer network and communication technology, more information and equipment will be integrated at different levels into the new VTS. Considering the five key words in the definition of e-Navigation, information collection, integration, exchange, presentation and analysis, a number of VTS-related issues are needed to discuss and study in depth, such as collection of ship's information, information exchange between internal and external systems, information management and analysis, training and certification of operators, long-range identification and tracking of ship, integration with other systems, and relevant legal issues.

VTS is a crucial and promising aid to navigation system in e-Navigation, it has an unique feature which other aid to navigation systems do not have, that is in the coverage of VTS, the information between ship and shore is of interactivity. When discussing and developing VTS, we should notice and make full use of this advantage. It should be recognized, for VTS development, e-Navigation is not only an opportunity but also a challenge.

One of IALA responsibilities is to set up a platform for international cooperation in the field of aids to navigation, exchange latest information and discuss issues of common interests. Recent years, IALA has done a lot of work in global development of VTS, such as holding VTS-related committee meetings, seminars, symposiums, workshops and drafting guidelines and recommendations. The development and coordination of global VTS is an important task for IALA. IALA will further encourage its members to actively involve in the activities of VTS development and strengthen the cooperation with other relevant international organizations in this area.

Safe homing is expectation for the mariners, as a captain navigating at sea for years and the Executive Director General of China Maritime Safety Administration, I asked my team, particularly my VTS staff, always keep this in mind and provide perfect aid to navigation services for mariners anytime and anywhere.

Ladies and gentlemen,

Bergen is a beautiful and fascinating place, especially in the summer season. I believe VTS2008 will be a successful and fruitful conference. Please allow me on behalf of IALA to extend my gratitude to our host, Norwegian Coastal Administration, for the nice arrangement and great support for this symposium. Also, I'd like to express my sincere thanks to all the representatives from maritime authorities, research institutions and manufacturers, thank you for your consistent support and involvement in the activities of IALA.

Wish VTS2008 a complete success.

Thank you for your attention.

Annex 4: Speech by Helga Pedersen, Minister for Fisheries and Coastal Affairs, Norway

1. Introduction

Organising committee, Mister chairman, speakers and distinguished delegates - on behalf of the Norwegian Government I am delighted to welcome you all to Norway, the city of Bergen and the 11th symposium on Vessel Traffic Services.

For hundreds of years, Norway has been a nation of shipping, fishing and trade. The last decades our waters have also been the arena for a significant production of oil and gas, adding a new dimension to Norway as a maritime nation. The development of maritime infrastructure, including sea ports, aids to navigation, pilot services and fairways, has been an important factor in the country's progress as a maritime nation. This development can be exemplified by lighthouses, which have progressed from using candles, wood and coal to gas and electricity, and from manual operation to full automation.

Today's aids to navigation comprise far more than lighthouses and other traditional installations. Vessel Traffic Services are to some extent the modern light house and are now highly important for providing a reliable basis for safe, secure, efficient and sustainable maritime transport, as well as for preventing accidents.

Globalisation and the ensuing demand for transport by sea of ever increasing volumes of goods necessitate a balance between freedom of navigation on the one hand, and organising of the maritime traffic and sustainable protection of the marine environment on the other. Climate change emerges as a new major global challenge. The maritime community has its share of the responsibility for the global warming we have been witnessing the last decade. Global solutions to reduce the emissions from the maritime industry should be sought through international agreements.

2. The High North/Arctic

With roughly half of Norway's land mass north of the Arctic Circle, and with the country's responsibility for vast areas of ocean, the High North will be a priority for Norway for many years to come.

Vast natural resources, both renewable and non-renewable, have been found in this area. Up to 25% of the world's undiscovered petroleum resources are believed to be found in the whole Arctic. Fishing resources, essential for the development of thriving communities, are also substantial. A crucial issue is how these resources can be utilized responsibly, and transported to the markets in Europe and America, without threatening the ecosystem. Maritime transport in the area is a particular challenge, and modern aids to navigation are of outmost importance.

3. Measures to meet new challenges for safety at sea

Norway has implemented a number of measures to meet the challenges of the expected increase in transport along our northern coast and specifically in the High North - and to improve safety at sea. Our aim is both to reduce the risks and to minimise the consequences if an accident occur. We are also constantly evaluating the need for new measures and technological developments.

Let me mention some of the measures we have implemented:

- **VTs**

A new Vessel Traffic Service (VTS) centre was opened in Vardø, in the north-eastern part of Norway, on 1 January 2007 and is one of five nationwide. It monitors traffic to and from Russia, and also coordinates tug response in conjunction with the Coastguard in North Norway. The centre is essential for the monitoring of maritime transport in the High North, and for promoting safe and efficient navigation in the area.

The VTS centres have two key tasks: monitoring vessel traffic, and reacting to undesired events.

Within my area of responsibility as Minister for Fisheries and Coastal Affairs, a Memorandum of Understanding between Norway and Russia was signed in March 2006. This agreement has strengthened Norway's and Russia's mutual work on maritime safety, and contributed to the task of establishing a joint Barents Vessel Traffic Management and Information System (Barents VTMS). The VTS centres in Vardø and Murmansk, on the Russian side, are central to this cooperation.

- Integrated surveillance system

Having information about the Northern North Atlantic and Barents Sea which is as complete and accessible as possible, will be of vital importance for emergency response purposes and for the regulation of shipping, as well as for dealing with environmental and energy issues.

In Norway, we have therefore started to work on developing an integrated surveillance system for the High North, collating data on the marine environment and on maritime activities in this region.

Such information may prove to be an important tool for the VTS centres in their work on maritime safety and the prevention of pollution from shipping.

- Ship routing

A vital step in Norway's effort to improve safety at sea and oil-spill response was taken on 1 July 2007. A system of 8 mandatory traffic separation schemes, combined with 7 recommended ship lanes was established, totalling some 560 nautical miles, stretching from eastern Finnmark to the southern tip of the Lofoten Islands. The scheme is situated outside of Norway's northern territorial waters, and is monitored by Vardø VTS. Moving the traffic away from the coast gives us better time for response in case of an emergency.

The scheme was established following approval by the International Maritime Organization (IMO). IMO is an important arena for us in which to gain an understanding of the different risks involved in maritime transport along the Norwegian coast, and to discuss the safety-enhancing measures considered necessary to meet these challenges. Support for the ship routing scheme in IMO from nations such as Russia and the United States was essential in bringing it about.

Shipping is so far responding well, and complying with the routing scheme. In the light of our experiences here, we are considering establishing similar traffic separation schemes along other parts of the Norwegian coast. Co-operation with the nations affected and various international organizations will be vital in this process.

4. Strategies and policies

Maritime transport is a global activity. A nation alone cannot deal with challenges related to maritime transport only at the national level. Norway therefore put great emphasis on cooperation at the international level. Globally IMO and IALA are obviously of outmost importance for Norway. It is especially good to see how the two organisations complement each other, something that this conference bears witness of.

At the regional level the cooperation with the European Union and EMSA has proven to be very fruitful. New arenas like the Northern Dimension, with a possible partnership for transport and logistics, will also be important for the development of multimodal transport infrastructure.

At the bilateral level, the cooperation with Russia has been a main priority for many years, and will be so for many years to come.

5. New technological developments

The new challenges for sustainable maritime transport and the environment may necessitate the development of new technologies to meet future monitoring needs. There are obvious benefits for international maritime transport if new requirements for both monitoring and safety are developed within the framework of international or regional cooperation.

Accordingly, both my ministry and our Norwegian Coastal Administration are participating actively in the development of both AIS and Long Range Information and Tracking System (LRIT) technology, within IMO and the European Maritime Safety Agency (EMSA).

- **SafeSeaNet**

We are also supporting and participating in EMSA's work on enhancing the monitoring of vessels - by harmonising the SafeSeaNet reporting and information systems of the EU and EEA countries into a common traffic monitoring infrastructure.

The SafeSeaNet system will take full advantage of AIS and LRIT technology, and should make a substantial contribution to the harmonisation and simplification of the different types of reports that ships are obliged to submit to the authorities. It will both save time for the navigator, and offer the authorities a better foundation for coordinating control and preparedness measures, particularly with regard to ships carrying hazardous materials.

- **Regional VTMISS**

The SafeSeaNet system accommodates some of the needs for regional vessel monitoring that we envisage in our area. We are therefore pleased that EMSA has given the Norwegian Authorities the task of coordinating one of five regions within a harmonised European SafeSeaNet system. We are currently working on establishing a regional Vessel Traffic Management and Information System (VTMISS) for the Northern North Atlantic and Barents Sea, in collaboration with other countries in this region.

6. Closing remarks

We still need to develop better knowledge, and discuss potential common international measures, on how to meet future challenges to sustainable maritime transport. In closing I would therefore like to thank IALA and the organisers of the Vessel Traffic Services symposium for providing an arena to discuss these important issues.

Thank you for your attention.

Annex 5: Keynote speech by Johan Franson, Chairman, IMO Council

Ladies and Gentlemen,

Let me begin by saying that I am honoured to be making the keynote address to this symposium. It gives me great pleasure to do so.

My position as a Swedish civil servant is that of Director of Maritime Safety at the Swedish Maritime Safety Inspectorate. I also happen to be elected Chairman of the IMO Council and that is, I believe, the reason why I am standing here before you today. That does not, however, mean that I am speaking for the IMO membership. IMO is a very democratic organization working according to the consensus principle. There is certainly some sort of consensus opinion within the IMO on the advantages of VTS but what I will say today must not be regarded as the views of IMO on VTS but rather as my own views.

I should also say that if you are looking for a power point presentation during my address, you will be looking in vain. I will simply talk to you.

My address will be dealing with VTS, naturally, but I cannot refrain from saying a few words on that very pertinent subject of e-navigation in the context of VTS.

There is not much need to take the participants in this symposium through the intricacies of the legal framework regulating the provision of VTS by coastal States or the participation in and compliance of ships and masters with the provisions of VTS. But allow me to highlight a few salient points.

We have a hierarchy in the international legal framework. On top we have – as usual, I almost said – SOLAS and, in this case, its regulation V-12, telling us that VTS contribute to safety at sea, efficient navigation and protection of the marine environment, that it is a binding undertaking by contracting Governments to establish VTSS when they are justified, that the establishment of VTS shall be in accordance with IMO's guidelines and the use of VTS be made mandatory only within the territorial seas of a coastal State, that flag States shall endeavour to secure the participation of ships flying their flags to participate and comply with the provisions of vessel traffic services. And finally – the regulation and the guidelines do not prejudice the rights and duties of Governments under international law or the legal regimes of straits used for international navigation and archipelagic sea lanes.

The regulation in SOLAS Chap V refers to Assembly Res 857, decided by the 20th Assembly. This in turn refers to MSC Res 43(64) as amended. Both resolutions refer to the IALA VTS Manual.

One thing, which strikes a reasonably knowledgeable amateur like myself – as far as VTS matters are concerned – when reading the resolutions and the manual, is the number of words used. The Assembly resolution in its official printed form consists of 18 pages of text, the MSC Res of nine pages and the IALA Manual, edition 4, of no less than 172 pages of text, excluding appendices.

My professional background is that of a lawyer. As a lawyer I made my living on words, and, sometimes at least, the more words the better but as a regulator and as responsible for surveys and inspections of safety and security I do not like many words. Even if what one is to regulate or guide is complicated, the regulation of or guidance to it does not become easier or better if the text describing the regulation to be done or the guidance is verbose. Rather the contrary. But since IMO and IALA work in a setting, which is truly international, and according to the principle of deciding through consensus, we tend to get very wordy documents. We should not, however, measure success in the number of pages of text we have decided but rather in the results, which we have achieved.

We know for a fact that IMO, with its impressive array of conventions and instruments, to a great extent has achieved or has begun to achieve its goals of improving safety and the protection of the marine environment. The number of total losses of ships shows a reasonably stable downward trend as do the number of large pollution incidents. It is a

crude yardstick to measure improvements in safety of life at sea and in the protection of the marine environment in the decrease of total losses and the decrease of large pollution incidents – but it is still a yardstick.

IMO has been working as an organization for 50 years; the Organization was formed in 1958, ten years after the signing of the IMO Convention. It would have been surprising and disappointing if there had not been an improvement. Unfortunately, this improvement has not been made clear in the minds of the general public but that is a different story.

Now, if IMO through regulating ships' construction, equipment, manning – to a certain extent – and operation of ships has managed to achieve improvements – what about the ancillary service to safety of shipping and protection of the marine environment provided to international shipping by VTS? Do we know anything about the effect of VTS on safety of shipping? I think we have a general feeling that it does contribute to the safety of shipping and protection of the marine environment – at least it says so in SOLAS. But there is no such handy yardstick as with the safety of ships.

Now, the regulation of ships' safety has been going on for 50 years. The regulation of VTS and the services provided to ships by a VTS is much younger. Certainly, we have had VTS provided in some places long before the present Chap V-12 but the international attempt to regulate is recent. VTS is also more of a national thing than ships are since a coastal state cannot, according to international law, have mandatory VTSs outside its territorial waters. The international shipping community through the IMO has only provided guidance to Governments as to how they are to provide VTS, non-binding guidance in their territorial waters.

I said earlier that the documents regulating and guiding VTS activities are very wordy documents. I also said that – in my opinion – that is not always a good thing. The sheer number of pages and words might be regarded as the degree of safety achieved but words as such never achieve safety. When it comes to ships' safety we have many words regulating that as well, certainly, but we are helped along by the fact that a good deal of the flag State surveys and inspections are carried out by a limited number of classification societies and active flag states and there are port State controls being carried. There is a system whereby the words are in a way substantiated. We do not have that system in the VTS world.

VTS activities, including mandatory VTS, are, if not proliferating, definitely growing in numbers world-wide. The main reasons for establishing them are given in V-12/1, i.e. contribution to safety, protection of the marine environment, adjacent shore areas, works sites and offshore installations from possible adverse effects of maritime traffic. VTS are activities affecting, and hopefully assisting international shipping but they are also activities protecting national and local interests.

I think we can foresee a growth in the number of VTSs. I think that many coastal states will wish to protect their national interests against the adverse effects of maritime traffic and – if my assumptions are right, international shipping will be more and more affected by VTS activities, which are national, coastal state activities

Studying SOLAS V-12, the Assembly and MSC resolutions I definitely think there should be something done. This is not anything which I think we can begin with today or tomorrow but it is something we should begin to think about.

I think the key issue is the training of operators and other personnel. Coastal states will establish VTS where they think they are necessary to protect their interests and/or the safety of maritime traffic; the national interests and the safety of maritime traffic are often intertwined. But this will affect international shipping and I think the shipping community will demand a certain minimum international level of competence from a VTS. When I say this I am primarily not talking about local port services but rather VTSs providing information service, navigational assistance service or traffic organisation service.

If one proposes an international minimum level of competence I would not be surprised if one would be met by the argument that VTS activities differ from country to country and from place to place and I am sure that they do to a certain extent. But, depending on the type or

types of service provided, I see no reason why the minimum level of competence for a type of service should differ from coastal state to coastal state. In principle, we demand the same level of competence from a deck officer irrespective of which type of ship he serving in. It should not really be very complicated to establish corresponding levels of competence for VTS personnel, differentiated, naturally, depending on the services they provide. I see no reason why these levels of competence should not be mandatory in the same way as the levels of competence in the STCW Convention are mandatory. We should begin to think about this but we do not have to do anything today or even tomorrow about it. We need to acquire some more experience.

Now I would like to turn to e-navigation, that still rather hazy concept. We have been talking for many years about e-navigation and not really knowing what we were talking about. But now things have started to move forward in a more orderly fashion. At NAV 54 the sub-committee developed a preliminary e-navigation strategy. The proposed strategy is to be submitted to MSC 85 for its approval.

Having an e-navigation strategy decided by MSC will, I think be a major step forward. As I have said we have been talking about e-navigation for years but we have not quite known what we have been talking about. Now we have an attempt to dissect the concept really to see what it is all about. The attempt is admirable but it is also a bit scary because it is so all encompassing. We have been talking about e-navigation for long and here we have a strategy identifying 20 ship-borne users and 34 shore-based users of e-navigation, whose interests shall be satisfied. We all also know that the technological development is rapid, not only concerning equipment for ships but also equipment for shore-based use.

There are a few words in the beginning of the proposed strategy, which I believe are key words. The words are: "if current technological advances continue without proper coordination there is a risk that the further development of marine navigation systems will be hampered through a lack of standardization onboard and ashore, incompatibility between vessels and an increased and unnecessary level of complexity."

I cannot but read this as saying – figuratively speaking – that the train is beginning to leave the station but we are still standing on the platform and have to begin to run and hope that we will be able to get onboard. Now, the effort, still figuratively speaking, we have to put into running, will be great because there will be many obstacles in our way, trying to get onboard the train.

I think it will be necessary for MSC to set very strict priorities when it will decide on the strategy. We have had examples in the not too distant history of IMO when sub-committees have been tasked with work that the work tends to run away on its own in directions which MSC had not foreseen.

The only reason for IMO to engage in work on e-navigation is safety at sea, protection of the marine environment and security of shipping. Many of the vessels identified by NAV as ship-borne users would certainly benefit from e-navigation but focus should, to my mind, be placed on commercial ships trading internationally. Of the more than 30 shore-based users focus should be placed on those who have to, from a safety, environmental protection or security aspect, interact with ships, i.e. mainly VTSs. If we do not go about our work in that or some similar fashion we will end up with a plate before us, which simply is too full to be digested.

What I have now said should in no way be interpreted as a criticism of the work done by NAV. On the contrary, it is an admirable piece of work which has lead to a possibility of intellectually understanding what e-navigation is all about and. A foundation has been laid on which we can build something which hopefully will work in the real world and add to safety and protection of the marine environment. It is now up to MSC to provide leadership for the work to come.

Ladies and gentlemen,

I am now getting close to the end of my time, so please allow me to briefly sum up.

I think that we in a not too distant future should set about deciding mandatory levels of competence for VTS personnel, levels adjusted to the type of services provided by a VTS. This will be necessary because of the interaction between VTS and international shipping, for which we have decided mandatory levels of competence of various crew members.

I think, finally, that we must see to it that MSC, when it comes to deciding the future direction of work on e-navigation, takes a firm grip on it and that the Committee prioritizes the work on e-navigation in relation to ships trading internationally and VTS interacting with those ships.

IMO as the competent international organization, mentioned in UNCLOS, for regulation of safety at sea and protection of the marine environment is dependent on IALA for the expertise it can provide!

Thank you for your attention!

Annex 6: Introduction to VTS2101 Salih Orakci, Director general of Coastal Safety, Turkey

Minister, Mr. President, Secretary General, distinguished participants, ladies and gentlemen, good morning to all.

First of all, I would like to thank to the Norwegian Coastal Administration, IALA and Organization Committee as they organized such an outstanding symposium successfully in this wonderful city Bergen. Besides, I also want to thank to the Norway once again for their unique hospitality.

Many distinguished speakers have shared their knowledge and experiences with us during these 4 days within the context of the symposium and I believe that; this symposium has attained the expected aims thanks to all speakers and participants.

As you all know well, there is no any system in the world to initialize the risk in any waterway. Because this issue is closely related not only with technological improvements but also human factors.

It is necessity that all the Flag State, Port State and Coastal States should perform their missions with the similar approaches at the same platform in order to increase the safety of navigation and minimize the risks.

We have an expression in Turkish Maritime “Vessel sinks at the Port”. Namely, if a vessel doesn’t take all necessary measures at the port before it leaves then it means that this vessel has already sank at the port.

Hereupon at the safe navigation period at port, it has the highest priority not just to ensure the appropriate Port and Flag State Control but also experience of master and to prepare his/her vessel for the safe navigation.

Actually there are many accidents in the past which were resulted in disasters although it could be prevented by the measures taken at the port.

As many speakers stated, the importance and role of VTS has been increasing in the world and this increase cause the rise of expectations unavoidably. IALA and VTS Symposiums have crucial mission in terms of operating and establishing of VTS all over the world coherently at the common platform as much as possible and also description and meeting of these expectations.

I don’t want to take up your time so I would like to mention briefly about the Directorate General of Coastal Safety that I am in charge of as a Director General. We are a state owned company operating under the Ministry of Transport. We do not just perform marine communication, tug boat and Search and Rescue services but also we are Turkish Straits VTS and Aids to Navigation Authority in Turkey.

I would like to truly say that it is a big honor and privilege for us to host all of you in Istanbul for the next IALA VTS Symposium and VTS Committee Meeting in 2012.

In this connection, I would like to thank to IALA Secretary General Mr. Torsten Kruuse for his support both for the Turkish Strait VTS and 2012 VTS symposium to be held in Istanbul and my thanks to the IALA Council which has agreed to hold the Symposium and VTS Committee Meeting in Istanbul.

I am well aware that it is too hard to be one of the last speakers as you all are tired and want to back your homes soon but I just want you to know a little bit what has been waiting for you in Istanbul that is the only city established in two continents with its old historical background and many different civilizations.

Therefore, If you let me I would like to show you a short video. I believe that you should live in Istanbul rather than to see but this may help you to forget your exhaustion tolerably.

I wish to see all of you at the next VTS Olympic Games in Turkey

Thank you for your kind and patient attention.

Annex 7: Social Events

Monday, 4th August: Welcome Reception at the Radisson SAS Royal Hotel

The Mayor of Bergen, Gunnar Bakke, hosted a reception for all delegates in the King Room of the Radisson SAS Royal Hotel, from 6 to 7.30pm. Drinks and a light meal were served.

Tuesday, 5th August: Symposium Dinner at Mount Floien

Delegates rode a scenic cable car to get to the Mount Floien area, to attend the symposium dinner. This event was hosted by Kirsti Slotsvik, Director General, Norwegian Coastal Administration. One of the highlights of the evening was a short performance by Christin Gulbrandsen, a singer, who had represented Norway in the Eurovision Song Contest in 2006.

Wednesday, 6th August: Industrial Members Evening at the Coastal Steamer Express Lounge

The IALA Industrial Members hosted a 'drinks and tapas' evening at the Coastal Steamer Express Lounge. The music band Storm Weather entertained delegates during the evening.

Thursday, 7th August: Festive Dinner at the Grieg Hall, Exhibition Area

Delegates attended a formal dinner in the exhibition area of the Grieg Hall.

Annex 8: Conclusions and Recommendations

Conclusions of the Symposium

1. Technology is enabling VTS to assume roles in emergency response, law enforcement, regulatory compliance, SAR and disaster management.
2. Global traffic monitoring and traditional VTS have roles to play in improving the efficiency of marine transportation.
3. Satellite detection of AIS can contribute to maritime domain awareness, particularly in remote areas and high latitudes.
4. IALA NET can provide a framework for the sharing of AIS data on a world wide basis.
5. There are no performance measures to evaluate the effectiveness of VTS.
6. Several multi-national alliances for regional VTS, AIS and / or vessel traffic management measures are in place.
7. There are no criteria for determining the need for VTS beyond territorial waters.
8. VTS operators should be held to high standards of performance.
9. Simulation is of value in VTS training and disaster preparedness.
10. The development and use of decision support systems can assist VTS personnel in managing information from disparate sources.
11. There is a need to ensure that mariners are aware of the types of VTS services available and their limitations Efforts must be made to increase interaction between ships watch-keeping officers and VTSO, leading to the creation of a 'wide area navigation team'.
12. The development of e-Navigation will improve the capabilities of VTS and, conversely, this improvement will contribute to the successful implementation of e-Navigation.
13. Shipping routes in polar regions are of increasing importance.

Recommendations of the Symposium

1. IALA should develop measures of effectiveness to evaluate the impact of VTS on the safety and efficiency of shipping and on the protection of the marine environment.
2. IALA should develop criteria for determining the need for VTS beyond territorial waters.
3. IALA should evaluate the impact of AIS satellite tracking and LRIT on the operation of VTS and other VTM instruments.
4. IALA should review the V103 and associated model courses to ensure that the level of training is consistent with the type of service (INS, NAS or TOS) being provided. This should include language proficiency testing.
5. IALA should encourage competent authorities to require that the training of VTS personnel is provided by accredited training institutes.
6. IALA should produce a poster / brochure explaining, in simple terms, what a shipmaster can expect from a VTS.
7. IALA should provide to IMO STW Sub-Committee; VTS-related topics, including language proficiency testing, for inclusion in the syllabi for mariner training.
8. IALA should develop guidance for VTS involvement in emergency response, law enforcement, regulatory compliance, SAR and disaster management.
9. IALA should continue to produce standards for data sharing among VTS and between VTS and ships.
10. IALA should develop guidance on the method of assessing risk when planning the marking of routes with aids to navigation in polar regions.
