



***International Workshop
on Next Generation VTS***

- REPORT -

16 to 20 January 2017
in Tokyo

hosted by

Japan Coast Guard (JCG)

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1. Outline

The International Workshop on Next Generation VTS was held from 16th to 20th January 2017 in Tokyo, hosted by the Japan Coast Guard (JCG). VTS experts from Australia, Sweden, Turkey, United Kingdom, Japan and International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) World Wide Academy (WWA) participated in the workshop. An apology was received from the expert of the United States. The workshop program is attached as Annex A and the list of the participants is attached as Annex B.

This report covers the discussion, findings and results of the meeting which included a study tour.

2. Background and objectives

Vessel Traffic Service (VTS) is now well recognized as an important tool for ensuring the safety and efficiency of navigation. As IMO Resolution A.857 (20) is the principal guide, there are many other VTS related IALA documents concerning operations, technology and training and it can be said that the VTS is becoming a matured service.

However, considering operational and technological developments in recent years, it is important to study how to use these developments in our future VTS appropriately to meet the changes of vessel traffic circumstances, such as ships becoming bigger, deeper and faster.

The Workshop, based on the present situation of VTS in each country, is aimed to identify what subjects should be developed in order to provide a better service in the future taking account of operational, technological and educational developments. The report is submitted to the IALA VTS Committee for information.

3. Schedule of the meeting

Day 1 – Monday 16th January 2017

Courtesy call on Commandant, JCG

Before the workshop, the participants made a courtesy call to the Commandant, JCG. After the self-introduction, Commandant Nakajima welcomed all participants and expressed his pleasure of holding the workshop and expectation of active discussion.

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Participants call on the Commandant, JCG

Opening ceremony

The workshop was opened formally by the opening address from Vice Admiral Kazuo Yagi, Director General of Maritime Traffic Department, JCG, who welcomed all participants. His welcome address is attached as Annex C.



Welcome Address by Vice Admiral Kazuo Yagi

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Participants at the Opening Ceremony

Adoption of agenda (Agenda 1)

The provisional agenda was adopted.

(Presentation) (Agenda 2): Present situation of VTS in each country

The participants made presentations with respect to the present situation of VTS in their countries based on the questionnaire of the situation of VTS.

Japan

Ms. Mayumi Arita, Officer for Safety Measures, Tokyo Wan VTS Center, Japan, explained about the outlines of Tokyo Wan VTS center. She informed the meeting about the history, features and regulation of Tokyo Wan VTS center. She showed an example of position differences between radar and AIS on VTS displays. She explained about the importance and difficulties of training of



English for non-English native speakers. She also mentioned that English skills were varied between each VTS operator and the response differed particularly in case of an emergency. She explained that many fishing boats operated in the traffic route and all VTS centers felt great pressure to deal with fishing boat traffic. She showed the situation that a lot of vessels passed the Uraga Suido Traffic Route and Irigo Suido Traffic Route.

Ms. Gerardine Delanoye asked if all fishing boats are equipped with AIS class B, what would be happened for VTS operators. Ms. Mayumi Arita answered that if so, too much information was displayed on VTS display that makes the VTS operator very busy.

Mr. Neil Trainor asked the difference of duties between port authority and the JCG. Ms. Mayumi Arita answered that port authority carries out good order and relevant operation

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of the ports in accordance with Port Regulation Act, whereas on the other hand, the JCG carried out good order for Traffic Routes and congested areas by Maritime Traffic Safety Act.

Mr. Tuncay Cehreli asked what type of class B AIS is used in Japan since class-B SO is not appropriate for fishing vessel because of the transmission interval. Mr Arita answered that the class B AIS in use in Japan is CS.

Ms. Monica Sundklev asked why there is a priority to vessels more than 200 meters. Ms. Mayumi Arita explained that as VTS operators know the movement of vessels more than 200 meters, VTS operators could provide information for small vessels such as fishing boats and small vessels could move smoothly as a result.

Mr. Kevin Gregory commented that native English speaking VTS operators sometimes does not use correct phraseology thus the language problem is not for only non-English native VTS operator.

Australia

Mr. Neil Trainor, Principal Advisor, Australian Maritime Safety Authority, Australia, showed snapshots of VTS in Australia. He explained that more VTS authorities are expected to be authorized in 2017 and VTS is growing business. He explained the regulatory framework, Navigation Act 2012 and Marine Order 64. He also described the criteria and the process for authorization of VTS in Australia. He explained about accredited VTS training organizations along with the standard for the approval of model courses. He also explained the obligations and responsibilities of masters related to VTS and navigation in general. He finally outlined some of the trends that may arise in the future.



Mr. Eiichi Masuda asked if Australian Maritime Safety Authority (AMSA) has a plan to increase the number of officers. Mr. Neil Trainor told that AMSA has increased the number of staff. AMSA does not operate VTS centers itself but is authorized as the competent authority based on the guideline published by IMO and IALA.

Mr. Eiichi Masuda also asked if there are any plans for increasing the number of VTS centers providing navigational assistance service (NAS) because there were only two VTS centers identified as providing NAS in Australia. Mr. Neil Trainor answered that there will be a possibility like other countries as the responsibility of NAS is increasing.

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Sweden

Ms. Monica Sundklev, Senior Advisor, Swedish Transport Agency, Sweden, gave a presentation on VTS and Ship Reporting System (SRS) in Sweden. There are nine VTS areas, but only four VTS centres in Sweden, due to the fact that one VTS centre is able to monitor several VTS areas depending on their size and complexity. SOUNDREP SRS started as a voluntary SRS in 2007, but since 2011 it became mandatory. SOUNDREP SRS is operated by Sound VTS Centre in Malmö, where both Danish and Swedish operators work together.



All Swedish VTS centres provide Information Service (INS) and Navigational Service (NAS), but although no VTS officially provides Traffic Organization Service (TOS), one VTS centre also provides traffic clearance at departure in the port of Göteborg. In Sweden, the reporting language is English. Each VTS area is rather small and vessel congestion is rare in Sweden. It was furthermore explained that an applicant for VTS operator was not by law required to have a maritime certificate, but the Swedish Maritime Administration normally requires master examination/licence as well as skills in maritime English and computer knowledge. A personal aptitude assessment is also made on selected applicants. The VTSO candidate also needs to fulfil VTS training courses, such as VTS operator training (V-103/1) and on-the-job-training (V-103/3).

Mr. Eiichi Masuda asked for some details of the personal aptitude assessment. She answered that it was a specific test for VTS operators to assess if they were appropriate and adaptable as VTS operators.

Mr. Eiichi Masuda also asked what the difference was between port VTS and Swedish VTS. Ms Sundklev answered that in Sweden there were many ports, but no port authorities had strong legal powers as is the case in most other countries and ports. Today, the Swedish Maritime Administration is appointed to provide VTS and the Swedish Transport Agency has the regulatory power to make regulations, for the moment only for the ships and not for the VTS provider.

Mr. Tuncay Cehreli said that maritime backgrounds of VTS operators vary from country to country bearing in mind different interpretations of IALA Recommendation V-103 as an IALA training standard. He added that, an aviation background is not required for air traffic controllers but they required a longer training and experience period as an assistant to become an air traffic controller.

Turkey

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Mr. Tuncay Cehreli, Coordinator, Directorate General of Coastal Safety, Turkey, explained about the AIS network over Turkish coast. He explained about the SOTAS systems, which is an AIS AtoN system established to monitor and manage AtoNs, collect information and monitor the vessel traffic. He also explained about the Vessel Traffic Management System and single window concept in Turkey which is currently being established. He mentioned accreditation, training and certification for VTS personnel and showed the key points of the VTS training.



Mr. Manabu Hara asked that whether AIS radar images were synthesized to other radar images in Turkey. Mr. Tuncay Cehreli said that all sensor data is fused and correlated in each VTS system in Turkey and other fusion processes will be established in VTM Systems to have a national single window.

Mr. Eiichi Masuda asked whether each radar in Turkey was independent or convergent to integrate. Mr. Tuncay Cehreli explained that radar back up in case of technical problems and overlapping coverage in particular areas were taken into account while positioning radars. He said that VTS operators don't need to choose and focus on radars because all radar and other sensors data are fused and correlated by the VTS system in one picture, VTS operators may use any part of this picture in accordance with his/her area of responsibility.

Mr. Eiichi Masuda also asked, what the background to gather information to VTM center ANKARA was. Mr. Tuncay Cehreli told that, it was a decision taken 8 years ago and that the IMO FAL Committee at its 40th session in 2016 made information based single window concepts mandatory for all coastal states by 2018. He also explained about the main ideas of what they expect.

United Kingdom

Mr. Kevin Gregory, IHMA representative to IALA, International Harbour Masters Association, United Kingdom, explained about a general overview of Vessel Traffic Services in the United Kingdom. He mentioned the role of the UK National Competent Authority, Accredited Training Organizations and both the coastal and port Vessel Traffic Services that were currently in operation. He said that the current and emerging trends in Vessel Traffic Services in the United Kingdom would be described with a focus on the particular challenges faced in the United Kingdom including the regulatory framework (including 'BREXIT'), the challenges of recruitment and training and the general level of VTS awareness.



Mr. Manabu Hara asked why London VTS had so many radars. Mr. Kevin Gregory told that there were an operational requirement based on risk assessment. He explained that

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the general policy was to ensure the safety of navigation in a critical waterway with full coverage and resilience of service.

IALA WWA

Ms. Gerardine Delanoye, Programme Manager WWA, IALA, explained about Scheldt VTS through an international treaty between the Netherlands and Belgium. She said why it was important to provide TOS for passing vessels because of several restrictions to the fairway, for example shifting shoals, strong tidal current, locks, vessels constrained by length and draft. She mentioned that how VTS operators provide TOS. She explained that this happened on several levels which are not mentioned in the relevant IALA publications. She also said that intense collaboration was required between partners for providing TOS and that this led to great advantages by providing better TOS.



Mr. Neil Trainor asked whether the long term TOS was being under VTS oversight. Ms. Gerardine Delanoye said that pilot services and VTS cooperated to share information and manage slots for the locks.

Day 2 – Tuesday 17th January 2017

Subject to be developed in future (Agenda 3)

The chair briefly explained the purpose of the questionnaire which was to understand the different applications of VTS in each country in order to consider future VTS needs. Some overseas experts questioned some of the items contained within the questionnaire. For example, 'what is the main VTS' was difficult to answer since there is no definition or different authorities may operate VTS centers. Another example was the purpose of AIS in the questionnaire, because the purpose may be different to each user, mariner, shore service provider or others.

Mr. Eiichi Masuda explained the background of this questionnaire in detail that the JCG needed to get budgets for improving VTS as Vice Admiral Kazuo Yagi, Director General of Maritime Traffic Department explained. Mr. Tuncay Cehreli said that it was necessary to be clear how you decided the needs for VTS and he also asked whether the JCG applied risk assessment tools for VTS. Mr. Eiichi Masuda said that the construction and improvement for VTS was based on the maritime safety acts in congested sea. He explained that some ports operated a VTS and they did not have the necessary certification and accreditation from the JCG. He also mentioned that the risk assessment tools, which were described in IALA guidelines, had not been conducted by the JCG and it was important for the JCG to apply to the risk assessment tool to VTS. Mr. Neil Trainor said that VTS authorities needed to use the risk assessment tool to consider alternative

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other safety measures, such as existing AtoNs and new AtoNs.

Mr. Eiichi Masuda explained the effects of implementing VTS in Japan referring to the number of accidents before and after the establishment of a VTS center. Mr. Tuncay Cehreli commented that the number of accidents prevented is not enough to assess the effectiveness of VTS but other important information provided by users and near miss information should also be taken into account. Mr. Neil Trainor explained the criteria needed to assess an application to become a VTS. He mentioned that risk assessment played a role to minimize the risk of accidents. Mr. Kevin Gregory mentioned two elements described to IALA recommendation V-119. He said that competent authority in the United Kingdom verifies the risk assessment for VTS. He also mentioned that they were auditing all VTS centers in the UK especially if there had been changes or incidents. Mr. Neil Tainor said that it was necessary to understand what the object of VTS was and how VTS authorities were going to provide VTS. Mr. Tuncay Cehreli mentioned the importance of understanding the core business of VTS.

Ms. Monica Sundklev showed a sheet of statistics collected in SOUNDREP SRS area in 2016. She explained the details of the statistics, which was, for example, inserted as main reasons of accidents and/or incidents. Mr. Tuncay Cehreli highlighted that there could be two effects of the report. One was to know what kind of situations that had occurred and the other was to show the effect of VTS for external stakeholders such as politicians. Mr. Tuncay Cehreli mentioned the aviation reporting system where they were required to report near miss situations and which enhanced the safety culture.

Ms. Gerardine Delanoye also said that Japan had become involved to develop the ASEAN VTS training and ASEAN countries wanted VTS, but the need for a VTS needs to be based on an assessment of the volume of traffic and the degree of risk, She mentioned that for smaller states the outcomes of such an assessment could be that improving AtoNs and pilot services might be sufficient instead of implementing VTS services.

Mr. Akihiko Hirota asked whether your organization had a main purpose of AIS for VTS except for prevention of maritime accidents. Mr. Tuncay Cehreli explained that the Turkish Coast Guard uses AIS for other purposes, particularly security purposes but it should be considered that the vessels in illegal activities can turn off their AIS so as not to show and identify themselves. Ms. Gerardine Delanoye said that it was important to positively identify ships via voice communication and over reliance should not be placed upon AIS data only. Mr. Kevin Gregory mentioned that AIS data could enable to see vessels that may be obscured by obstructions such as bridges. He said that maritime safety authority in the UK used AIS for law enforcement in the UK.

Ms. Gerardine Delanoye mentioned the additional constraint in the use of AIS for monitoring AtoN in very dense traffic areas it could be the case that during daytime no

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data will be available as all AIS slots are occupied. She explained that in developing countries they are not often aware of the difference between shore based AIS data and satellite AIS data.

The chair explained the information that United States Coast Guard made a mandatory carriage requirement of AIS class B for more than 20 meters vessels in VTS areas because of not only the safety but also security. Then he asked if there was any VTS that clearly defines its objective as security. Mr. Tuncay Cehreli said that there were regulations requiring the mandatory carriage of AIS class B for vessels longer than 15 meters and commercial vessels longer than 10 meters in Turkey. He said that it was almost impossible to monitor the movement of these vessels because the position of them may be close to the shore and to each other. Mr. Neil Trainor commented that it was difficult to understand the position of small vessels in local ports because large vessels masked small vessels. He also mentioned the attention of VTS operator to concentrate on duties.

Ms. Gerardine Delanoye considered that for some developing countries monitoring coastal traffic via shore based AIS data could help in fighting piracy as the attacked vessel will alter course and speed in an uncommon way. It could be considered for developing countries with few resources to combine a coastal VTS with other services such as MRCC, National Coordinator for Maritime Safety Information, Port Management etc.

With regard to the liability issue to VTS operators, Mr. Tuncay Cehreli commented that the liability issue was occurred by not only the provision of NAS but also other services, INS and TOS. Ms. Gerardine Delanoye remarked that a wrong information sometimes caused an accident so the liability was covered by all VTS services. Mr. Tuncay Cehreli added that some VTS authorities and mariners misunderstood the difference between NAS and navigational assistance which is the core business of VTS.

Mr. Eiichi Masuda asked how to make Standard Operating Procedure (SOP) in each country. Mr. Kevin Gregory answered that the basis of SOP was described briefly in IALA Recommendation V-127.

Ms. Gerardine Delanoye commented that because INS, NAS and TOS were sometimes not clear to understand, and that there was a need to ensure that mariners were aware of the differences between them. Mr. Tuncay Cehreli pointed out that the VTS services are already defined by IMO A.857(20) and a comprehensive study and discussions are needed to decide to change or revise them. Mr. Neil Trainor agreed but said that each service of VTS was defined by IMO Resolution A.857(20) and there was a need to consider the change of the Resolution.

The chair showed the summary of the presentations and said that the following agendas would discuss based on the summary.

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Operational development (Agenda 4)

The chair started the session by describing the subjects for the future VTS from operational perspective.

Regarding the liability of VTS operators, Mr. Tuncay Cehreli said that the liability of VTS operators was not an issue not only in the provision of NAS but also INS and TOS. He mentioned that the definition of VTS made by IMO, means that VTS should interact with the vessel traffic and respond to traffic situations developing in the VTS area.

Mr. Kevin Gregory said that VTS committee is now considering the review of relevant IMO documents with respect to making the types of service clearer for more effective implementation.

Mr. Eiichi Masuda said that air traffic control uses more understandable and detailed communications and manages aircraft more than VTS and that some of its aspects may provide solutions for VTS operators.

Ms. Gerardine Delanoye said that when considering the future service, the relevant IALA documents should be reviewed and updated because some VTS Authorities misunderstood or misused message makers. Mr. Tuncay Cehreli said that we cannot reconsider the type of services unless the IMO Resolution is updated. Mr. Neil Trainor said that IALA had not the power to revise the IMO definitions. The Chair was asked how many sessions of NCSR may be needed to revise the Resolution. Mr. Tuncay Cehreli explained that even the IALA VTS Committee has spent many sessions to discuss the matter but not reached a final conclusion yet.

Mr. Tuncay Cehreli said that autonomous ships are now being studied and developed and are expected to become operational around 2030. He explained that VTS functions should be improved or changed in order to accommodate this development.

Regarding the VTS beyond territorial sea, Mr. Neil Trainor pointed out 25% of those who responded to IALA VTS questionnaire, provided its service beyond the territorial sea. Mr. Tuncay Cehreli said that four of five Turkish VTSs provide service beyond the territorial sea and 100% of ships within that area voluntarily participated in the VTS.

Mr. Neil Trainor said that the Australian VTS authority intends to extend the VTS boundaries in territorial sea because once the VTS area is declared it has the power for vessels to participate. The chair explained that the JCG plans to introduce the recommended route inside the territorial sea and then asked whether your country had the mandatory route beyond territorial sea. Mr. Akihiko Hirota asked if there is a TSS outside of the territorial sea. Mr. Neil Trainor explained that Australia has a TSS outside of the territorial sea. He explained that vessels were required to report entering the area and a lot of VTS areas had reporting system. Ms. Monica Sundklev explained that the ship reporting system SOUNDREP, operated by Sound VTS, is situated in the Sound

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between Sweden and Denmark, which is considered to be an international strait and that there also exists a special international treaty from 1857.

Technological development (Agenda 5)

Mr. Eiichi Masuda explained that the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the JCG decided to expand the AIS mandatory carriage requirement from 500 tons to 150 tons and the regulation will be revised near future. He also explained that the JCG now studies the use of smartphone which is cheaper than AIS, to monitor the movement of small vessels, such as fishing boats. He also said in addition to the smartphone, the JCG has conducted an examination in Tokyo Bay using CCTV and an infrared camera and successfully detected small vessels.

Ms. Gerardine Delanoye said that there was a project of informing to yachts by using smartphone in Netherlands. She said that it is important to keep on developing e-Navigation because developing countries need new technology in order to provide maritime safety information to small craft. In these countries e-Navigation could fill the gap of years of development. Mr. Kevin Gregory said that a study of using smartphone to monitor small vessel has being carried out to monitor the rowing community on the River Thames. He added that broadcasting MSI by smartphone is more complex issue. He explained that the pilots in Thames Estuary uses smartphone tablets but the coverage is limited and a safety assessment is needed. Mr. Neil Trainor commented that he agreed to sue smartphone for monitoring purpose but careful consideration is needed because the smartphone has its limitations.

Ms. Monica Sundklev said that the European Maritime Safety Agency (EMSA) has an overall system for monitoring vessel traffic in EU waters by using AIS (terrestrial and satellite) and LRIT. The data can be shared within EU Member States. Mr. Eiichi Masuda asked whether ID or pass was needed to get information from EMSA, but Ms. Sundklev answered that the information was not for public use, but for relevant authorities only.

Mr. Tuncay Cehreli said that they have not used such tools yet to share AIS information with other countries but tools are used to make AIS information available for relevant national authorities and organizations.

Mr. Eiichi Masuda said that the JCG provided high accessibility to Electronically Charts (ENC) and asked how to disseminate ENC in your country. He added that Japan is now studying on exchange of AIS data and smartphone position data. Mr. Tuncay Cehreli answered that SOTAS uses a special chart similar to ENC to demonstrate AIS AtoNs monitored vessels and other information as layers.

The chair explained that the JCG is planning to use virtual AIS AtoN as a tool to inform of issues such as areas to be avoided and asked if there is a country uses virtual AIS AtoN for monitoring vessel movements. Ms. Gerardine Delanoye said that virtual AtoNs

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were used in a secondary fairways in the Netherlands and one of the outcomes were that vessels seeing these virtual AtoN's anticipated differently as vessels not able to see the virtual AtoN and that this could lead to confusion. Ms. Gerardine Delanoye explained the example use of virtual AtoN's for temporarily marking of dangers or for special user groups for example cruise liners operating in small Pacific Islands. Mr. Neil Trainor told that the AMSA used virtual AIS AtoN for testing but not for actual operation. Ms. Monica Sundklev said that, according to her knowledge, there was no case of virtual Aton's in Sweden. Ms. Gerardine Delanoye stressed that she would foresee that the certified AtoN Manager would deploy the virtual AtoN's instead of adding this to the tasks of VTS Centres in order to keep the AtoN and VTS services separated.

Mr. Neil Trainor explained that VTS was introducing some decision support tools which complemented the VTS operation. Mr. Eiichi Masuda mentioned the problem of boredom of VTS operators as mentioned at the IALA VTS symposium and it was important to keep motivation. Mr. Tuncay Cehreli asked the maximum hours of VTS operators of monitoring in front of console in Japan. Mr. Eiichi Masuda answered VTS operators watched console about 1.5 hours. Mr. Kevin Gregory told that the risk came back to the effective management of human factors. Mr. Tuncay Cehreli said that we should consider the human factors on VTS and explained three types of stresses, hypo stress, normal stress and hyper stress. He said that we should consider the level of stress that VTS operators handle each shift. Ms. Gerardine Delanoye said that we should refer to experiences gained in air traffic control systems. Mr. Eiichi Masuda explained the analysis from actual incidents. He also said that doing this analysis was very difficult because this was taken after the incident had occurred. Mr. Neil Trainor said that incident analysis processes depended on VTS centers. Ms. Gerardine Delanoye explained when investigating an incident the team doing this investigation should be aware that the single VTS Operator is doing more tasks when looking at an enlarged play back of the moment of the incident. She said that a lot of accidents or near misses were happened during taking over of the watch. Mr. Tuncay Cehreli said that VTSs should have procedures for watch handover.

Day 3 – Wednesday 18th January 2017

Mr. Eiichi Masuda explained the plan to reduce the number of AIS base stations because it was very expensive to replace AIS equipment and the number of vessels passing Japanese sea was small and it was rare to be congested. Mr. Tuncay Cehreli told that it may be a cost-effective way only to receive AIS information by receive only AIS equipment to monitor the vessel traffic. He also said that it was available to use online information and smartphone to monitor vessel traffic in some areas. He mentioned that the cost of monitoring vessel traffic using SOTAS was not much. Ms. Monica Sundklev described that according to an EU directive every Member State was required

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to cover its coast by AIS. She advised that the JCG should consider what is needed out of a maritime safety perspective because it can be very costly to cover a complete coastline where there is no traffic. Mr. Neil Trainor mentioned that satellite AIS was generally able to monitor vessels every 15 minutes so it had a possibility to consider AIS satellite options in those areas. Mr. Kevin Gregory told that it was a cost-effective option to only receive AIS information at the base stations for monitoring and covering vessel density and UK uses the receiver only stations in low traffic area.

Mr. Eiichi Masuda explained a research that studied user rate of checking the AIS text messages in the 1st Region and the result showed that only 1% of vessels checked the text messages from the JCG. He asked how to use AIS text messages in your countries. Mr. Tuncay Cehreli said that they used AIS text messages as the 2nd options although they have an integrated system in front of VTS operators. He said that the mariner would prefer to concentrate on a visual look out in highly congested areas as opposed to radar or ECDIS. As the 2nd points, he said that it is also subject to understanding of the information because some vessels acknowledged the text message but could not understand the information appropriately. He said that VTS operators should not use AIS text messages in close collision risk situations because AIS text messages may not be received and understood quickly, this kind of communications should be conducted by closed loop verbal communications. Closed loop verbal communications also make the information and the intention of the vessel(s) available for the other vessels in the vicinity. He said that text or digital messages will be available in the near future by using other means, VDES is available in technical perspective but we should be considered further at the operational perspective, particularly its availability and effectiveness on the bridge. He said that some ships have only one person on the bridge even in congested areas where a lot of information may be sent.

Mr. Neil Trainor said that shore side was interested in the use of text messages but that there is a problem with respect to their display on the bridge on systems such as MKD. Mr. Kevin Gregory said that UK VTS had the capability of transmitting and receiving AIS text message, but they are rarely used because there were many information sources received on board and there was a risk of ignoring the message. He also said that some UK pilot used a Portable Pilot Unit to receive the text and other AIS messages. Mr. Neil Trainor said that we needed to integrate main system on the bridge to utilize the AIS message effectively. Mr. Tuncay Cehreli said that SOLAS vessels must have ECDIS and it will change the situation but there was too much digital information, so those on the bridge needed intense concentration to interpret all of the information available. He said that route exchange systems using ECDIS were available and effective for the future, but the legal issues and responsibility were not clear yet. He mentioned that accidents between vessels receiving the message from ECDIS and small crafts without ECDIS or

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AIS may happened.

Mr. Neil Trainor explained that we needed to understand the technology and concept what was trying to do. Ms. Gerardine Delanoye said that we needed to consider the space allocated to large vessels available with respect to traffic management. Mr. Tuncay Cehreli explained that air traffic management was based on instruction, but sea traffic management was based on advice and mostly mutual agreement but not instruction. He also said that instructions to vessels should be result oriented and the decision on the maneuver (e.g. changing course for collision avoidance) should be left to the vessels

Mr. Kevin Gregory explained that we could use prediction tool by VTS data to identify that the certain areas where traffic may become congested in the future, so we could identify congested area early and take proactive steps. Mr. Neil Trainor explained the dynamic system that could predict where two ships encounter and its location 30 minutes later. He said that examples showed vessels slowed down the speed and avoided accidents using such systems.

Educational development (Agenda 6)

Mr. Kevin Gregory explained the work of IALA VTS Committee WG3 that recently developed Model Course V-103/5 and studied the human factor issues such as fatigue and stress. He added that the big issue now discussed was mandatory training. Ms. Gerardine Delanoye said that mandatory training for VTS operators is important to consider toward the future as well as how to check the quality of the training organisations.

Mr. Kevin Gregory said that relating with the mandatory training, international mobility of VTS operators should be considered. Mr. Neil Trainor said that the most governments recognize IALA V-103 but not as mandatory. Mr. Tuncay Cehreli explained the history of VTS operator training in IMO and explained that since IMO considered this issue was completed, to make the VTS training mandatory globally is not easy.

Mr. Neil Trainor told that AMSA has a law to make the training mandatory for VTS authorities in Australia.

Other development (e.g. legal) (Agenda 7)

Mr. Neil Trainor explained that the other matter we should consider was legal matter and this was parallel to IMO Member States Audit Scheme (IMSAS). Mr. Eiichi Masuda said that Japan was audited by IMO seven years ago. He told that the auditor visited the Tokyo-Wan VTS center, and checked the documents and the procedures related to the operation and management of the VTS. There was no problem in the audit but the auditor commented that in emergency, the responsibility of the Ministry was divided by many officials and so the responsibility may become unclear. Ms. Monica Sundklev

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informed that there are several documents for preparation of IMSAS included VTS because VTS was a part of SOLAS. Mr. Neil Trainor said that IMSAS preparation on VTS issues was described by IALA Guideline 1115. Ms. Gerardine Delanoye told that VTS and AtoN are subject to IMSAS only the responsibility could be different authorities depends on the government.

Mr. Neil Trainor explained that how to evaluate the effectiveness on VTS was one of aspects considered in future. He also said that public expectation to VTS was increasing and it was important to focus on the purpose of VTS. Mr. Tuncay Cehreli told that public expectation was usually increased after marine accidents happened. Ms. Monica Sundklev said that there was an increased demand for monitoring the whole coastal area by VTS from the public as an increasing purpose was security and not maritime safety and she raised a concern on such a trend.

Mr. Kevin Gregory said that fundamental principles were found in SOLAS chapter V however now VTS missions were increasing and therefore collaboration, communication and cooperation among stakeholders were needed. Ms. Gerardine Delanoye mentioned that many countries have established and operated VTS but caution should be taken to ensure that VTS is not implemented without taking account of SOLAS, the volume of traffic and degree of risk. Often the total cost of ownership has not been taken into account and this can finally make the VTS not to operate successfully.

Mr. Neil Trainor said that the contracting government of SOLAS had a decision of establishing VTS and some country planned to cover the whole coast by VTS.

What is the next generation VTS (Agenda 8)

Presentation

Mr. Koichi Nishida explained the plans of JCG. He explained the measures which would be unifying Tokyo-wan VTS center and 4 port signal offices to one VTS center. He told that the JCG would apply diagrams like trains to manage vessels and to indicate a hotspot by using navigational plans in advance. He said that the JCG would predict and foresee navigational routes using big data. He told the visualization system of evacuation intension and anchoring congestion by coloring each vessel. He also told that the JCG was considering how to monitor the movement of small vessels which did not equipped with AIS using such as infrared camera and smartphone.



Ms. Gerardine Delanoye commented that some countries have already centralized their VTS and this makes VTS operators impossible to have a visual on the situation. In some cases having the possibility to look out of the window has benefits that are

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underestimated by the people deciding on the centralization of several VTS centers. Mr. Tuncay Cehreli also commented that when centralized VTS, back-up system should be considered. He added that the utilization of diagram would become a good decision support tool.

Day 4 – Thursday 19th January 2017

The participants accompanied by JCG officers went to the study tour of Yokohama Port Signal Office, which had responsibility for the port traffic regulations and the efficiency management.

Mr. Kanou, Director of the office, explained the organization, facilities and operations of the Yokohama Port Signal Office that had worked for 30 years and contributed to maritime traffic safety and efficiency of navigation in the congested sea areas of Yokohama.

They observed the actual vessel traffic situation from rooftop of the office and JCG staff explained the navigational rules and functions for the safety navigation around Yokohama Route.

After the observation of Yokohama Port Signal Office, they visited Kotokuin placing at Buddha and Hase temple in Kamakura. They took a walk around historical structures from Kamakura era, and rested with tea and Japanese traditional sweets. They spent the refreshment within the mood of Japanese culture and national heritages.



Study tour of Yokohama Port Signal Office

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Visit Kotokuin placing at Buddha

Day 5 – Friday 20th January 2017

Executive summary

The participants developed the executive summary that would be sent to IALA VTS and ENAV Committee for their consideration. The Secretariat will develop the full report and send to the participants for their comments and amendments.

Mail address to meeting secretary in JCG: jcghkokugikaihatsu1-6r9i@mlit.go.jp

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Closing Ceremony

Deputy Director General Tokunaga thanked the participants for their active contribution and firm cooperation to the workshop. He expressed his hope for making a face to face network between them and JCG for the safety navigation in the world sea.

On behalf of the participants, Mr. Tuncay Cehreli told their congratulation of the successful workshop and appreciating to JCG for the workshop.

The chair closed the meeting.



Closing Speech by Deputy Director General Tokunaga



Closing Speech by Mr. Tuncay Cehreli

Annex A

Detailed Schedule

Of

International Workshop on Next Generation VTS

16-20 January 2017

16th	January	
Time	Events	Facilitator
1100-1115HRS	Orientation	JCG
1130-1200HRS	Courtesy call on Commandant, JCG	
1200– 1330HRS	Lunch	
1330– 1400HRS	Opening Remark Photo Session Briefing	
1400– 1430HRS	Presentation by JAPAN	
1430– 1500HRS	Presentation by AUSTRALLIA	
1500– 1530HRS	Presentation by SWEDEN	
1530– 1600HRS	Break	
1600– 1630HRS	Presentation by TURKEY	
1630– 1700HRS	Presentation by UNITED KINGDOM	
1700– 1730HRS	Presentation by IALA WWA	
1730– 1900HRS	Break & Move	
1900 –2100HRS	Reception	
2100HRS	End of Day 1	

17th	January	
Time	Events	Facilitator
0930– 1030HRS	Discussion (Agenda 3)	JCG
1030– 1100HRS	Break	
1100– 1200HRS	Discussion (Agenda 3)	
1200– 1330HRS	Lunch	
1330– 1500HRS	Discussion (Agenda 4)	

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1530– 1600HRS	Break	
1600– 1800HRS	Discussion (Agenda 5)	
1800HRS	End of Day 2	

18th	January	
Time	Events	Facilitator
0930– 1030HRS	Discussion (Agenda 6)	JCG
1030– 1100HRS	Break	
1100– 1200HRS	Discussion (Agenda 6)	
1200– 1330HRS	Lunch	
1330– 1530HRS	Discussion (Agenda 7)	
1530– 1600HRS	Break	
1600 –1800HRS	Discussion (Agenda 8)	
1800– 1830HRS	Break & Move	
1830 –2100HRS	Reception	Japan Aids to Navigation Association(JANA)
2100HRS	End of Day 3	

19th	January	
Time	Events	Facilitator
0930– 1030HRS	Trip (from hotel to VTS)	JCG
1030– 1200HRS	Tour of Yokohama Port Signal Office	
1200 –1600HRS	Lunch & Visit Kamakura Facilities	
1600HRS	End of Day 4	

20th	January	
Time	Events	Facilitator
0930– 1100HRS	Conclusion	JCG
1100– 1130HRS	Break	
1130– 1200HRS	Closing Remark	
1200– 1330HRS	Lunch	
1330HRS	End of Day 5	

Annex B

List of Participants

Name	Country	Organization		E-mail
Mr.Tuncay Cehreli	Turkey	coordinator	Directorate General of Coastal Safety	tcehreli@kegm.gov.tr
Mr Neil Trainor	Australia	Principal Advisor	Austrakian Maritime Safety Authority	neil.trainor@amsa.gov.au
Ms Monica Sundklev	Sweden	Senior Advisor	Swedish Transport Agency	monica.sundklev@transportstyrels.en.se
Mr.Kevin Gregory	United Kingdom	IHMA representative to IALA	International Harbour Masters Association	kcsgregory@gmail.com
Ms.Gerardine Delanoye		Programe Manager World-Wide Academy	IALA WWA	gerardine.delanoye@iala-aism.org

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Japan

Name	Country	Organization		E-mail
Mr. Nobuo Kikuta	Japan	Director	Administration and Planning Division, Maritime Traffic Department, Japan Coast Guard	jcgchkokugikaihatsu-4r3x@mlit.go.jp
Mr. Akihiko Hirota	Japan	Director for Research of Maritime Traffic Regime	Same as above	jcgchkotsukikakuhourei-9z7s@mlit.go.jp
Mr. Hideki Noguchi	Japan	Assistant Director	Same as above	jcgchkokugikaihatsu1-6r9i@mlit.go.jp
Mr. Eiichi Masuda	Japan	Special Assistant to the Director	Same as above	jcgchkokugikaihatsu2-9s8t@mlit.go.jp
Mr. Toshinobu Miyamoto	Japan	Assistant Director	Navigation Safety Division, Maritime Traffic Department, Japan Coast Guard	jcgchkotsukanri3-5e6u@mlit.go.jp
Mr. Tomoyuki Suzuki	Japan	Special Assistant to the Director	Same as above	Same as above
Mr. Kazuya Hajime	Japan	Special Assistant to the Director	Same as above	Same as above
Mr. Tamotsu Ikeda	Japan	Chief Executive Director	Japan Aids to Navigation Association(JANA)	ikeda_t@jana.or.jp

Annex C

Remarks at the Opening Ceremony of
International Workshop on Next Generation VTS
VADM Kazuo YAGI

Good afternoon ladies and gentlemen. I am very glad to welcome all of you here, the International Workshop on Next Generation VTS.

VTS, as you know well, is recognized as one of the most important tools for the safety and efficiency of navigation and protection of marine environment in the world maritime community.

For that purposes, the Japan Coast Guard established our first VTS center in Tokyo bay 40 years ago and is now operating 7 VTS centers along the busy navigation route in accordance with the international standards by IMO and IALA.

However, maintaining the world standard VTS is not easy job. It takes some costs and efforts to maintain its operation, equipment and staff. I presume the situation is similar in your country. But especially in Japan, because of our surrounding situation, our budget for the safety is now being reduced a lot, but I do not want to reduce our safety level. On the contrary, I want to increase our safety level more in future.

Therefore I am very happy to invite you, the top VTS experts in the world, and discuss the present situation, subjects to be solved and how to solve the subject taking account of emerging new technologies, new method or new scheme in order to provide better, safer and more efficient future, next generation VTS.

Before the discussion, I dare to say that country differs, off course systems differs. I understand that all your countries are operating the world standard VTS but the approach, method or solution to maintain differs a lot in each country. Besides, in the case of VTS, the department in charge also differs. We are coast guard, but many of you, maritime traffic department is in the charge. So it is important to grasp the outline of each country's natural, geographical, social situation in which the VTS is put. I think it is a small but important tip of mutual understanding.

Finally, since it is the coldest season in Japan, please take care of yourself and I hope that you enjoy not only the workshop but also our culture, history and food.

Thank you very much.

Annex D

Report of International Workshop on Next Generation VTS

Executive Summary

The International Workshop on Next Generation VTS was hosted by the Japan Coast Guard (JCG) in Tokyo, Japan from 16th to 20th January 2017. The purpose of the workshop was to identify and examine subjects that may be considered for next generation or future VTS by means of sharing the current situation and trends of VTS in each country.

The workshop was attended by VTS experts from Australia, Sweden, Turkey, United Kingdom, Japan and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) World Wide Academy. An apology was received from the expert of United States due to illness.

Key components of the workshop included:

- Gaining a common understanding of the current status of VTS in each of the participating countries.
- Identifying differences in the implementation and operation of VTS between countries.
- Identifying elements that may require further consideration to achieve the next generation or future VTS.

The results of a questionnaire circulated by JCG prior to the workshop provided invaluable input to the workshop discussions.

The workshop was structured as four days of discussion and a one day study tour to the Yokohama Port Signal Office, with public events on Japanese tradition and culture which the international experts enjoyed.

The workshop highlighted that the international framework for VTS is clearly defined in SOLAS regulation V/12. However, noting that the international guidance for VTS as provided within IMO Resolution A.857(20) has not been updated in the past twenty years, the following topics were identified which may assist in further discussions on the

Report of International Workshop on Next Generation VTS

consideration of future VTS policy and operation:

1. Operation

1.1. Balancing the safety and efficiency of vessel traffic:

Desired improvements in efficiency should not compromise safety.

1.2. Effective data and information exchange/sharing and its management:

Data and information exchange/sharing is becoming increasingly important for improving the safety and efficiency of vessel traffic. The operational management of data and information exchange/sharing should be considered.

1.3. Operating VTS beyond traditional boundaries (e.g. coastal or regional):

The 2016 IALA VTS questionnaire identified that 25% of respondents operated VTS beyond the territorial sea. Some VTSs also operate Ship Reporting Systems.

1.4. VTS awareness, including quantification of its benefits:

VTS awareness amongst authorities, mariners and the public could be improved. Consideration should be given to adopting measures to demonstrate the effectiveness of VTS and communicate these as appropriate.

1.5. Delivering VTS within the scope of IMO Resolution A.857(20):

Does the Resolution constrain or pose barriers to the future development of VTS?

1.6. Communication and phraseology:

Standardized communication and phraseology are crucial for effective interaction between bridge and VTS.

2. Technology

2.1. AIS and new digital communication tools such as VDES:

Some VTSs use AIS as a communication tool and new digital communication tools such as VDES are now being developed.

2.2. Technology of shipborne navigational systems and equipment such as Minimum Keyboard Displays (MKD):

Some shipborne navigational systems and equipment, such as MKD, have limited capability for the portrayal of digital information.

2.3. e-navigation:

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How will future VTS embrace e-navigation and emerging concepts?

2.4. New technology for decision support tools:

New technology, such as route prediction and the use of big data, is becoming available for use as decision support tools.

2.5. Autonomous ships:

The study and development of autonomous shipping has commenced and its emergence will have an impact on vessel traffic.

3. Education and Training

3.1. Human factors and developing procedures:

Development of new procedures should always involve careful consideration of human factors.

3.2. Mandatory training/certification and global competency:

VTS training/certification should be mandatory, in conjunction with increased standardization.

3.3. Training trainers and instructors:

In order to conduct proper education and training for VTS operators, trainers and instructors should be appropriately trained and certified.

4. Others

4.1. IMO Member States Audit Scheme (IMSAS):

Under IMSAS, contracting governments to SOLAS are required to demonstrate they give effect to their SOLAS obligations for VTS.

4.2. Expectations from authorities, the public, mariners, allied services and other stakeholders:

Development of future VTS should recognize increased expectations from authorities, the public, mariners, allied services and other stakeholders.

The report will be sent to the IALA ENAV and VTS Committees for further consideration.