

Vessel Traffic Services:

their role in efficient port operations



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The International Maritime Organisation (IMO) defines Vessel Traffic Service (VTS) as the service implemented by a competent authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. Therefore the efficiency of vessel traffic is one of the main tasks in VTS operations. But from a practical point of view, how can VTS affect the efficiency of port operations in addition to increasing the safety of navigation?

The International Association of Lighthouse Authorities (IALA) – the main organisation responsible for developing international recommendations for VTS – divides regular VTS duties in three different categories.

Providing information

The first and most simple service is the Informational Service (INS). This serves to ensure that essential information becomes available in time for on-board navigational decision-making. Generally under this service, VTS operators provide vessels with all information related to a port's operations or to navigational safety. Even such a simple service allows an increase in port efficiency as such information can consist of position, identity, intention and destination of vessels, and amendments; also included are changes in information concerning the VTS area, such as boundaries, procedures, radio frequencies, reporting points, meteorological and hydrological conditions, maneuverability limitations of vessels and much else. Using this information, the team on the bridge can optimise its own passage in order to improve passage time, avoid dangerous situations and thereby improve port performance.

Managing traffic

Another and more advanced service provided by VTS is the Traffic

Organisation Service (TOS). TOS is a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the declared VTS area. Examples of this service could be planning or prioritising vessel movements, establishing a system of traffic clearances, organising the allocation of space, following special routes or time slots, observing speed limits, etc.

In carrying out their duties, VTS operators monitor a developing situation and interact and coordinate with the vessel traffic. Thus, the operator should be the key person providing cooperation between all stakeholders – bridge and port teams.

A typical vessel call to a particular port usually starts with a request from the vessel agent which includes vessel particulars, the quantity of onboard cargo and the estimated time of arrival. A special planning department reviews such requests and includes them in the port plan. The daily port plan is one of the most important documents for ports and services and can typically involve pilotage services, terminal operators, tug operators, border police, customs and many others. Delays or conflicts between available resources in a busy port are unavoidable so minimising them is important if the efficiency of the port is to be increased.

VTS operators organise traffic management in a safe and efficient way, based on the daily plan and taking into account a whole host of factors, including current traffic density, pilots, berth and tug availability, as well as port limitations such as tidal level, weather conditions, temporary restrictions and others. VTS personnel can monitor vessel deviations from the initial sailing plans and, when working closely with the bridge, can give the crew a recommended arrival time in order to avoid congestion and delays.

Navigational assistance

The most advanced offering VTS can provide to vessels is the Navigational Assistance Service (NAS). NAS provides essential and timely navigational information to assist in the on-board navigational decision-making process and to monitor its effects. Such a service could be provided, for example, when there is poor visibility, bad weather conditions, there is a risk of grounding or collision, or for assistance to anchoring, etc. Naturally, the main role of this service is to ensure the safety of navigation which can affect port performance through delays, and even incur financial losses in the case of a major navigational accident.

In discussing VTS services, it is necessary to mention the technical tools that can help improve the efficiency of a VTS operator's work.

IT to the rescue

For many years, vessel calls were associated with large amounts of varying paperwork. But recently, the development of modern information technologies has allowed the transition from paper to electronic forms and provides all stakeholders with a common platform containing all the necessary information. An example is the Transas Port Management and Information System (PMIS). PMIS contains a distributed database engine and all interaction between the parties is arranged via this database, i.e. the agent can fill-in all necessary forms for vessel calls via a web interface. Notification of the planning team with new requests will be received via e-mail from the database. During the planning stage, Transas PMIS will automatically detect conflicts (for example, an already-occupied berth or pilot) and will not allow an improper allocation going to the user. Finally, the prepared plan will once again be broadcast automatically to stakeholders, and every pilot or tug operator can connect to the same database at any time and get



About the authors

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About the company

Transas Group is a world-leading developer and supplier of high technology solutions for the transport, oil, gas and security industries. With more than 200 VTS installations worldwide, Transas continues to focus and develop its expertise in a wide range of sectors: vessel traffic management, coastal surveillance, offshore and renewable energies, and other industry sectors. Transas' highly flexible and scalable solutions are suitable for nearly all ports and harbours, complying with international standards and ensuring maritime safety and navigation efficiency, as well as protecting the marine environment.

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Top: VTMS of Cyprus operator station;
Bottom: VTMS of Orkney Islands, UK,
operator station.

their own plan for daily operations. This means that all participants work in the same environment and with the same information. This minimises the risks of misunderstandings and the propagation of incorrect information. Additional restrictions established in the database help to avoid human error, which can often happen when paper documentation is used.

e-Navigation

The modern concept of e-Navigation provides even more possibilities to all participants, as it is focused on berth-to-berth navigation. For instance, as part of this concept, the vessel's sailing plan is sent to the VTS centre and can be confirmed by the VTS operator while the vessel is still moored at the previous port. Dozens of confirmed sailing plans will automatically create a preliminary plan of port operations. Deviations from such plans can be detected at an early stage

and allow a change to be made to the schedule of port operations in a flexible and efficient way.

The possibilities within NAS are mostly based on the performance of modern VTS equipment. As NAS directly affects on-board decision-making, this requires very strict criteria for the quality and accuracy of VTS sensors. VTS radar equipment should provide the VTS operator with reliable and accurate data in all weather conditions. Creating such a state-of-the-art VTS system could be challenging from both financial and technical points of view, but the benefits from advanced VTS, especially in busy ports, are also obvious.

Of course, the training of VTS operators is also an important factor. For efficient VTS operations, all personnel should be properly trained according to the latest international recommendations. This is a factor that should not be forgotten when establishing a VTS system.

Summary

Advanced VTS systems can provide a Traffic Organisation Service and a Navigational Assistant Service based on modern technical solutions. Investment in VTS can benefit not only navigational safety at the port (which is undoubtedly a huge advantage), but also provides benefits to port stakeholders when it improves port operations, minimises delays and conflicts through the proper coordination of traffic in the VTS area.