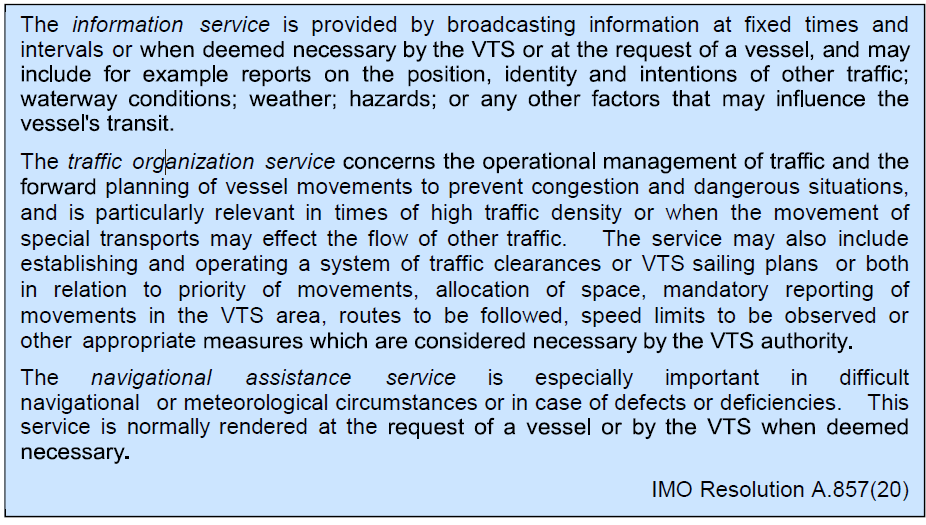
# Input to VTS manual – chapter 11

Introduction

Link to VTS services INS NAS TOS

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# 1101 Introduction

The scope of this section is to introduce a suitable grouping of functional requirements, to break these down into essential contributing functions (and to use these to link into the preparation of system and sub-system level technical requirements). NB need to make ref to existing more detailed documentation.

NB this follows from the iterative process involving risk assessment, CBA and initial conceptual designs.

The required features and, in particular, the need for coverage by sensors, e.g. radar, should be

determined by an assessment of the service to be provided, the safety level to be achieved and the user requirements of the VTS system. Subsequently, suitable positions for the equipment should be determined by site survey, analysis, simulations and/or site-tests to ensure that required functions and coverage will be provided. Detailed guidance is given by IALA Recommendation V-119 - *Implementation of Vessel Traffic Services* and IALA Recommendation V-128 - ‘*Operational and Technical Performance Requirements for VTS Equipment*.~~’~~

# Types of service

The type of service should be derived for each sub area within the VTS boundary.

Refer back to TOS descriptions, and in following sections describe the primary and secondary functionality required to support these levels of service

## INS (see guideline 1089)

Primary requirement: Communication Services

Secondary requirement: Information gathering, for example:

* Traffic Image compilation
* Meteorological Information gathering
* Hydrological Information gathering
* Prevailing routing information and restrictions to manoeuvrability
* Status of Navigational Aids
* Relevant Port information

## TOS

Primary and secondary functional requirements to be discussed

* Vessel Movement Scheduling / Separation / Prioritisation
* Sailing Plans
* Pilotage
* Special procedures for managing Hazardous Cargo carrying vessels
* Management of berths / anchorages
* Ship Reporting System
* Fairways and Speed Limits
* Re-routing of traffic around special events or works.
* Enforcement action

## NAS

Primary and secondary functional requirements to be discussed

* Grounding warnings
* Collision warning
* Advice where on board equipment has failed

# Preparing for and Setting up a VTS System

Introducing the Recommendation and Guideline

Deriving requirements?

Link to V-119 and V128 process linking Op to tech requirements

Operational requirements, functional requirements

Technical requirements at system level

High-Level System Design/Requirements

Modelling/Performance Estimates/Risk Assessment

* Radio communications coverage;
* Sensor coverage;
* Communications network infrastructure;
* Data architecture and interfaces;
* Reliability and Availability including any redundancy options;

Cost Benefit Analysis

Finalising the VTS System Requirements / Procurement

System Implementation

System Operation

# Operational requirements

Establishment of operational requirements is described in...

Suggested breakdown of operational requirements into 4 functional areas as below;

## Communications

Communication is the only absolutely essential component of a VTS System. Without the ability to communicate Traffic Image information to vessels at sea, the VTS Authority cannot provide a service to incoming or departing vessels. It is therefore essential that good communication coverage is planned and implemented for the whole of the VTS Area. It should be noted that this includes both voice and data communication services. eNavigation may enable data communication with vessels for the sharing of VTS Information Services and therefore the radio communication architecture should be designed to accommodate all forms of communication services.

VHF Communication is the main form of voice communication with and between maritime vessels. Whilst a section of the maritime VHF band may be converted for digital use from 2017 onwards, the remaining section of the maritime band is one of the few remaining radio services that uses analogue technology. It is therefore inefficient in its use of the bandwidth in the VHF section of the frequency spectrum and VTS Authorities should therefore use the available channels sparingly.

The analogue, broadcast, nature of the VHF maritime band has resulted in misunderstandings between VTS Operators and watch-keeping personnel on board ships. It is strongly recommended that where VTS Operators need to communicate with a specific vessel, the call should be initiated by addressing the MMSI number of the vessel instead of using a Channel 16 broadcast.

VHF Communication is Horizon limited in range and therefore where the VTS Area extends beyond the horizon, other forms of communication service are necessary. This could include MF/HF Radio, Satellite Communication Services and mobile phone services. A vessel that is within Coastal waters but out of VHF range, may be contacted by mobile phone if it is within an area of coastal GSM coverage.

### Shore-ship

Voice communication

data communication

### Shore-shore

Voice communication

data communication

## Situational awareness;

### Detecting and Tracking targets within the VTS Area

Detecting and tracking targets within the VTS area is a core part of the Traffic Image compilation function of VTS systems. However, traffic image compilation is a function that will be based on different issues for each VTS Authority and the selected sensors for traffic compilation do not determine the level of capability of the VTS. Each VTS Authority should therefore assess its traffic image needs based upon the actual circumstances that exist within its VTS Area.

Use of radar, AIS and other sensors data

Traffic Image maintenance

Sensors

Radar

AIS

EOS

RDF

Other (LRIT, Sat-AIS)

Data management

Vessel Traffic Databases

Cargo, Voyage

Sensor data processing

Environmental Monitoring and Protection

Weather

Hydrography

Pollution detection?

Presentation of Information to the Operator

Traffic image

Decision support / Alerting

Cooperation with other VTS Authorities / other agencies / Pilots / Allied Services

## Recording and playback;

Recording and replay incl. Post Situational Analysis

Legal implications

## Reliability, Availability, Maintainability

Maintenance

Redundancy and Resilience

Graceful degradation