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| IALA Guideline |

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Guideline on how to develop a safety culture in VTS

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# Introduction

According to the internationally recognized concept and theory of safety culture, all accidents can be prevented, and all hidden dangers of safe operation can be controlled. Therefore, safety culture plays an irreplaceable role in ensuring the high-quality operation of VTS and realizing the high-quality development of VTS. The process of developing a safety culture is essentially the process of advocating VTS safety concepts, regulating the safety behavior of VTS personnel, and improving the safety quality of VTS personnel.

# Document purpose

VTS safety culture plays an important role in ensuring the safety operation of VTS and realizing the purpose of VTS to improve the safety and efficiency of vessel traffic in the VTS area. Since IALA already have establish guidance on several of the topics that falls within the term “safety culture”, the purpose of this guideline is to promote focus on the subject and to provide links to guidance developed.

Conferring with existing VTS stakeholders will provide a general idea of how VTS safety culture could be developed.

This Guideline is not intended to be prescriptive, rather it presents factors that should be considered when developing a safety culture in VTS centre.

# Definition of VTS safety culture

The HSE International Advisory committee define safety culture as:

*The safety culture of an organization is the product of induviduals and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of an organizations health and safety management.*[[1]](#footnote-1)

From the perspective of VTS, safety culture refers to the sum of VTS personnel's ideology, way of thinking, ethics, values and other spirits, ideas, behaviors and physical state of VTS safety. Has the following characteristics:

* Gradually formed in the operation of VTS；
* Accepted and followed by all VTS personnel；
* Has its own characteristics；
* An essential part of VTS operation.

# Principles for developing VTS safety culture

The development of VTS safety culture should follow the following four principles: consistency, full participation, openness and sustainability.

## Consistency

When the VTS provider develops a safety culture, should fully consider and be consistent with the VTS operational goals.

## Full participation

The VTS safety culture is related to all the personnel of the VTS provider. Therefore, the participation of every VTS personnel is required during the construction process.

## Openness

The safety culture of each VTS provider shall be open to stakeholders and their opinions shall be solicited during the construction process to improve the VTS safety culture.

## Sustainable

In order to ensure the effectiveness of safety culture, VTS safety culture should be a dynamic mechanism that can be modified and improved.

# Elements of Safety Culture

Organisations making safety a priority share common characteristics often described through the five elements, Learning Culture, Informed Culture, Just Culture, Flexible Culture and Reporting Culture.

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Figure 1 Elements of Safety Culture

## Learning Culture

To be a learning culture an organisation must possess the willingness and the competence to draw the right conclusions from its safety information system and the will to implement major reforms.

Reports contributes to safety when an organisation learns from them. Learning will occur from both reactive and proactive safety assessments and is promoted by an inherent organisational willingness to adapt and improve.

## Informed culture

An informed culture is a culture which those who manage and operate the system have current knowledge about the human, technical, organisational and environmental factors that determine the safety of the system as a whole.

An informed culture is a culture where people understand the hazards and risks inherent in their areas of operation. Personnel are provided with the necessary knowledge, skills and job experience to work safely, and they are encouraged to identify the threats to safety and to seek the changes necessary to overcome them. An informed culture relies on having a strong reporting culture.

## Just culture

Just culture is described as an atmosphere of trust in which people are encouraged for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour.

An informed culture relies on a reporting culture which in turn relies on a Just Culture. All employees must clearly understand and recognise that it is unacceptable to punish all errors and unsafe acts regardless of their origins and circumstances while it is equally unacceptable to give blanket immunity from sanctions to all actions that could, or did, contribute to organisational accidents. A prerequisite for engineering a just culture is an agreed set of principles for drawing the line between acceptable and unacceptable actions.

## Flexible culture

A flexible culture is a culture in which an organisation is able to reconfigure in the face of high tempo operations or certain kinds of danger, often shifting from the conventional hierarchical mode to a flatter professional structure.

A culture of safety is flexible, in the sense that decision-making processes vary, depending on the urgency of the decision and the expertise of the people involved.

## Reporting culture

A reporting culture is described as a culture where managers and operational personnel freely share critical safety information without the threat of punitive action making people willing to report errors and near misses.

The issue is not whether the organisation has a reporting system; it is whether, as a matter of practice, errors, near misses, hazards and risks are reported. A reporting culture depends, in turn, on how the organisation handles blame and punishment. If blame is the routine response to error, then reports will not be forthcoming. If, on the other hand, blame is reserved for truly egregious behaviour, involving recklessness or malice, reporting in general will not be discouraged. Rather than a blanket no-blame approach, what is required, Reason argues, is a just culture.

# IALA guidelines promoting THE development of a safety culture

All IALA VTS guidance documents could be perceived as promoting the development of a safety culture, whether directly or indirectly. Some guidelines however, are more relevant in the context of promoting the elements of safety culture including guidelines on reporting, training and assessment:

* V103/5, Vessel Traffic Service Revalidation Process
* G1052, Quality Management System for AtoN Services Delivery
* G1101, Auditing and Assessing a VTS
* G1118, Marine casualty – incident reporting and recording including near-miss situations as it relates to VTS.
* G1131, Setting and Measuring VTS Objectives
* G1141, Operational procedures for VTS

# Basic framework of VTS safety culture

The basic framework of VTS safety culture includes at least four parts: safety concept, safety regulatory, safety behavior and safety material.

Figure 2 Basic framework of VTS safety culture

## Safety concept

The safety concept is shared by all VTS personnel. It is the safety awareness and way of thinking that is solidified in the mind. It is the decisive factor of the VTS safety culture. It governs and directly affects the safety regulatory, safety behavior and safety material culture. The safety concept includes elements such as safety values, safety willingness and safety goals.

## Safety regulatory

Regulatory culture is the textual expression of the safety culture. It transforms the safety concept into a restriction on the specific behavior of VTS personnel or a specification of the equipment operation process.. The safety regulatory may include IALA regulations, national regulations and VTS provider's internal specifications.

## Safety behavior

Behavioral culture is the behavior performance of safety concept. Different safety concepts lead to different safety behaviors. VTS safety behaviors can include VTS safety training, VTS safety incentives, VTS emergency management, information communication and exchange, etc.

## Safety material

Safety material is the carrier and materialized expression of the safety concept culture. Material culture includes VTS facilities, equipment and operating procedures, operating environment of VTS personnel, VTS safety identification and emergency preparedness, etc.

# Methods for constructing VTS safety culture

The construction of VTS safety culture needs long-term and unremitting efforts. Through a series of activities, the safety ideology and behavior habits of VTS personnel can be cultivated from the four aspects of safety concept, safety regulatory, safety behavior and safety material environment, so as to construct VTS safety culture.

## Safety concept

Safety concept is the basic basis for VTS to carry out all safety activities, and it is also the highest level of VTS safety culture construction.

### Refine the core values of VTS safety

Safety values derive from safety practices, and at the same time, they in turn guide safety practices. The formation of VTS safety values comes from two aspects: one is the mandatory requirements of the state and superiors; the other is long-term safe work practices.

### Publicize and promote safety concepts

VTS should vigorously cultivate and promote the core values of safety. For example, various communication channels such as text, video and pictures can be used to publicize and disseminate safety values and safety management requirements to VTS personnel so as to strengthen the safety awareness of VTS personnel.

### Actively guide VTS personnel to practice safety concepts

Strengthen the safety management of VTS and stakeholders to ensure that safety is the first priority in all work.

## safety REGULATORY

The safety regulatory is the skeleton of the VTS safety culture. It is not only the refinement and concrete realization of the VTS safety concept in work, but also the result of the VTS's past safety culture construction.. To develop a VTS safety culture from the regulatory level, the following key points must be grasped:

### Establish and improve the safety system

The safety management system is not only the foundation of safety management, but also an important content of safety culture construction. It is necessary to strengthen the safety awareness of all VTS personnel through strict implementation of rules and regulations to avoid management and operation errors.

### Strengthen the implementation of the safety system

The vitality of the system lies in the implementation. It is necessary to establish the authority of the safety system, strengthen the inspection of the implementation of the system, and make the safety system truly become the safety code of behavior followed by all VTS personnel.

## safety Behavioral

Safety behavior culture is the key to the construction of VTS safety culture, and good safety behavior is the basis of creating excellent safety performance.

### The role of managers

Managers are the most critical factor in the construction of VTS safety culture. They should take the lead in implementing safety system.

### Guide VTS personnel to implement safety behavior standards or guidelines

In order to regulate the safety behavior of all VTS personnel, the VTS provider shall establish safety behavior standards for key posts and places for all VTS personnel to implement. At the same time, the safety awareness and skills of VTS personnel should be strengthened.

### Carry out safety behavior assessment

VTS provider should conduct regular safety risk identification to detect and correct the unsafe behavior of VTS personnel in a timely manner to improve unsafe behavior.

## safety material

Material safety culture is the embodiment of VTS safety culture and the objective carrier of safety concept.. VTS should focus on the construction of safety material culture from the following aspects.

### internal safety

By identifying, evaluating and controlling all risks in the work, create a good work operating environment for VTS personnel;

Ensure sufficient safety investment to ensure the safety and reliability of facilities or equipment, such as office appliances, air conditioning and lighting, toilet facilities, drinking water equipment, safety alarms, etc.

Provide VTS personnel with labor protection supplies according to regulations and requirements, and improve the working conditions of VTS personnel;

Apply advanced safety management technology to upgrade the old installations or old equipment.

### External safety

As a social organization that operates within a comprehensive environment in which ships, ports, allied services and other organizations fulfil their respective roles, as appropriate to provide external safety for VTS.

# Factors when developing a safety culture in VTS

## VTS quality management system

It is suggested that VTS providers should fully integrate the established VTS quality management system documents when developing VTS safety culture guidelines, so as to ensure the effectiveness of VTS safety culture guidelines institutionally.

## THE WORKLOAD OF VTS PERSONNEL

VTS safety culture should play a role in overcoming the adverse effects of working environment in VTS, alleviating physical and mental fatigue of VTS personnel, and alerting VTS personnel to fully perform their job responsibilities.

## the differences of cultural

Different countries and regions may have different understandings of safety culture. VTS providers should fully consider factors of cultural differences when developing guidelines for VTS safety culture.

## emerging technologies

With the application of advanced technology and equipment in the field of VTS, the intelligent level of VTS service and management, and the level of VTS occupational health protection will continue to improve, which will affect the VTS safety culture.

## financial support

VTS safety culture, especially material culture construction, is closely related to the economic support that VTS can obtain. VTS providers should consider local economic support when developing VTS safety culture guidelines.

# ASSESSING safety culture

The different aspects of safety culture can be assessed using a combination of several different methods including questionnaires, interviews, observations and audits.



Figure 3 Possible assessment tools

Several tools have been developed and are available as guidance for the assessment of safety culture. Some examples of such tools are listed in Table 1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Title of tool(kit) | Developer/  Owner (Author) | Country  (origin) | Sector  (origin) | Pragmatic | Analytic | Academic |
| Score Your Safety Culture Checklist | Transport Canada  (James Reason) | Canada | Transport  (and  healthcare) | Simple checklist |  |  |
| Hearts & Minds programme –Understanding Your Culture Checklist | Energy Institute  (Shell in collaboration  with Leiden and  Manchester Universities) | UK -  Netherlands | Offshore | Safety culture maturity ladder with 5 stages - assessment of 8 factors (18 questions) in workshop |  |  |
| Safety Climate Assessment Toolkit and User Guide (LSCAT) | Loughborough University, Health &Safety Executive(HSE), and a number of offshore organizations | UK | Offshore |  | Employee attitude survey | Face-to- face interviews and focus discussion groups Structured observation |
| Safety Health of Maintenance Engineering (SHoMe) Tool | UK Civil Aviation Authority  (developed by Health and Safety Engineering Consultants (HSEC) | UK | Aviation  maintenance |  | Question naires (with software and guide) |  |
| Nordic Occupational  Safety Climate Questionnaire  (NOSACQ) | Consortium of some Scandinavian institutes | Scandinavia | Construction |  | Safety climate questionnai re (50 questions) |  |
| IAEA Guidance for Use in the Enhancement of Safety Culture | International Atomic Energy Agency (IAEA) | International | Nuclear | 3 stages of development of safety culture - assessment of 5 factors by individuals or group | Contains information | Contains information |

Table 1 Examles of assessment tools

1. HSE International Advisory committee [↑](#footnote-ref-1)