 Input paper: [[1]](#footnote-1) VTS39-10.3.1 (VTS38-10.3.1)

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **□** ENG **□** PAP **X** Input

**□** ENAV **X** VTS **□** Information

Agenda item [[2]](#footnote-2) 10

Technical Domain / Task Number 2 3

Author(s) / Submitter(s) Australian Maritime Safety Authority,

Australian Maritime College

Develop Guidance on Human Factors Management in VTS

(Task 3.3.1, 2014-18 Work Programme)

# purpose of the document

The purpose of this document is to provide input in the commencement of Task 3.3.1 - Develop Guidance on Human Factors Management in VTS as part of the Committees 2014-18 Work Programme

The authors have reviewed guidance notes and other relevant literature with respect to design within the maritime industry and assessed their applicability to Vessel Traffic Services. The result is a framework that could contribute to the work of the Committee in progressing Task 3.3.1.

## Related documents

This document has considered a number of similar documents that have contributed to the understanding of human factors and its role in design in the maritime industry. Of particular note are the:

* American Bureau of Shipping (2003) publication Guidance Notes On Ergonomic Design Of Navigation Bridges,
* IACS Rec.95 (2007) Recommendation for the Application of SOLAS Regulation V/15 Bridge Design, Equipment Arrangement and Procedures (BDEAP).

The document also uses definitions from the Draft Human Centred Design Guidelines – Annex 4 of the Strategic Implementation Plan for E-navigation (IMO REF).

# Background

Human factors is the scientific discipline concerned with the application of what we know about people, their abilities, characteristics and limitations to the design of systems they use, environments in which they function and interact, and jobs they perform to optimise human well-being and overall system performance. Human factors and the ‘human element’ (as it occurs in the maritime domain) are terms that are often used interchangeably.

When this understanding is embedded in a design process, it is likely to create a number of benefits. These benefits include higher efficiency and effectiveness, greater levels of user satisfaction and higher levels of safety. The combination of these and other elements is known as ‘usability’. In order to achieve usability, it is necessary to follow a human centred design process.

Human Centred Design (HCD) isan approach to system design and development that aims to make interactive systems more usable by focussing on the use of the system; applying human factors, ergonomics and usability knowledge and relevant techniques. The term “human-centred design” is used rather than “user-centred design” in order to emphasize that this standard also addresses impacts on a number of stakeholders, not just those typically considered as users. However, in practice, these terms are often used synonymously.

**Vessel Traffic Services is part of a larger Socio-Technical System.** A Socio-technical system recognises that the interaction between [people](http://en.wikipedia.org/wiki/People), [technology](http://en.wikipedia.org/wiki/Technology) (i.e. equipment and systems) and their physical and organisational environments will improve the design process. If the VTS is to support the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore (through e-navigation) then the design of the VTS becomes especially important.

# Discussion

The proposed guideline would typically include an introduction, background and scope. This would utilise references relevant to IALA and other documents/standards. These parts have not been included in this INF paper.

Following the introduction, a range of topics are recommended for inclusion in the guidelines and these are listed below.

**General Principles of Human Factors**

* VTS as part of a Socio-Technical System
* Identifying the Roles and Responsibilities of VTS Personnel

**VTS Work Environment**

* Stress
* Fatigue/ Fatigue Management
* Workload
* Situation awareness
* Individual differences
* Decision-making and sense-making in VTS
* Error and error management

**The VTS Physical Environment**

* Noise
* Lighting
* Heating, Ventilation and Air Conditioning

**Human-Centred Design**

* Using an Human-Centred Design Approach – An introduction
* Principles of Human Centred Design
* Other relevant principles for implementation and management of change in a VTS

**VTS Workstation Functionality**

* Vessel Traffic Service levels and standard functionality
* Ancillary VTS Functions

**VTS Workstation Arrangement and Layout**

* Internal/External Visibility
* Overall Arrangement
* Traffic/movement within the VTS
* Sound Signals and audibility

**Console and Workspace Design**

* Configuration
* Location of Instruments and Equipment

**Detailed Design**

* Display Arrangements
* Information Displays
* Organization of Visual Information
* Display Design
* Integration of Displays and other systems
* Decision support systems for VTS
* Display other systems Failure Prevention

**Design of Alarms and Warnings**

* Typical alarms for VTS
* Alarm/Warning Transfer Systems
* Visual Alarms
* Audible Alarms

**Procedures, Codes and Job Aids**

* Coding
* Operating and Emergency Procedures
* Labels, Placards and Job Performance Aids

**Organisational Safety**

* VTS Safety Management
* Organisational and safety culture
* Incident and accident reporting

**Facilities**

* Food and Refreshment
* Sanitary Facilities
* Interior Décor

A number of other documents might be considered as appendices in such a guideline. These include checklists for those using the guideline during procurement/tendering process.

# Action requested of the Committee

The Committee is requested to consider items provided in this document in progressing Task 3.3.1 - Develop Guidance on Human Factors Management in VTS.

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)