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

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

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

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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 to support Task 3.3.1 - Develop Guidance on Human Factors Management in VTS as part of the Committees 2014-18 Work Programme.

In February 2015 the Australian Maritime Safety Authority led a workshop in Melbourne, Australia to consider in particular Support for the development of a guidance document on human factors and ergonomics in VTS.

The workshop reviewed the paper VTS 38/10/3/1 (previously submitted by Australia) that identified a framework that could contribute to the work of the Committee in progressing Task 3.3.1.

IALA held a workshop on Human Factors and Ergonomics in October, 2015 to provide further information to the Working Group to support this item.

This document reflects on the results of that workshop and how those results might alter a framework for Guidance on Human Factors Management in VTS

## Related documents

This document is a modified version of VTS XXXXXXX.

VTS 38/10/3/1 sourced information from a number of documents including:

* 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.

IALA has scheduled a workshop to examine the issue of human factors within the VTS environment and this document is intended to support the work that will occur in the workshop, leading to Task 3.3.1 - Develop Guidance on Human Factors Management in VTS as part of the Committees 2014-18 Work Programme.

# 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**

All activity with respect to the implementation of VTS (including design, installation and management thereof) shall occur with due recognition of the implications for the human element, with the aim of:

1. Facilitating the tasks to be performed by the VTS team and allied services in making full appraisal of the situation to support the objectives of the VTS authority including primary and ancillary tasks.
2. Promoting effective and safe joint activity between the VTS team and allied services;
3. Adopting the principles of safety culture and recognising the need to manage organisational change using a structured approach.
4. Adopting the principles of human centred design; accounting for human capabilities and variability.
5. Recognising the implications of providing VTS services within a complex socio-technical system;
6. Enabling the VTS team and allied services to have convenient and continuous access to essential information which is presented in a clear and unambiguous manner, using standardized symbols and coding systems for controls and displays;
7. Supporting, where appropriate, the harmonized collection, integration, exchange, presentation and analysis of marine information by electronic means to enhance berth‑to-berth navigation and related services.
8. Indicating the operational status of automated functions and integrated components, systems and/or sub-systems;
9. Allowing for expeditious, continuous and effective appraisal of situations and associated decision-making by the VTS team and allied services;
10. Preventing or minimizing excessive or unnecessary work and any conditions or distractions which may cause fatigue or interfere with the vigilance of VTS team and allied services ; and .
11. Minimizing the risk of human error and detecting such error if it occurs, through monitoring and alarm systems, in time for the VTS team and allied services to take appropriate action.
12. Acknowledging the gap between work as imagined (in policies, procedures and associated documents) and work as enacted (in normal operations) and making appropriate efforts to narrow this gap.

**Human Performance and Variability**

* Stress
* Fatigue/ Fatigue Management
  + Staffing levels and roster arrangements
* Workload
* Situation awareness/Distributed Cognition
* Acknowledging and Managing individual differences
* Decision-making and sense-making in VTS
* Error, Error management and Normal Operations
* Team Work / Maritime Resource Management and Joint Activity
* Communications
* Occupational/Workplace Health and Safety

**The VTS Physical Environment**

* Noise
* Lighting
* Heating, Ventilation and Air Conditioning
* The physical space

**Human-Centred Design**

* Principles of Human Centred Design
* Using an Human-Centred Design Approach
* Associated Design Standards (referencing: Work-station functionality, arrangement and layout; console and workspace design; design of alarms and warnings

**Procedures, Codes and Job Aids**

* Hand-overs (shifts, sectors)
* Coding
* Operating and Emergency Procedures
* Labels, Placards and Job Performance Aids

**Organisational and Safety Culture**

* Quality management and Safety Culture
* VTS Safety Management
* Implementation and management of change in a VTS
* Organisational and safety culture
* Incident and accident reporting
* Internal Accident Investigation
* Use of Performance Indicators in Quality and Safety Management
* Recruitment, Selection and Retention
  + Psychometric testing

**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)