VTS56-10.4.4

**Input paper for the following Committee(s):** **Purpose of paper:**

ARM  ENG  PAP  Input

ENAV VTS  Information

**Agenda item** [[1]](#footnote-1) 10.4

**Technical domain/ Task number** 2 3.1.1 Develop guidance for dealing with stress or trauma in VTS operations

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pilot project psychosocial health VTS operators via BioRICS Mindstretch©

# Summary

The pilot project utilizing the BioRICS Mindstretch© system at the Port of Antwerp-Bruges was conducted to evaluate the impact of high vessel traffic volumes on the mental energy and psychosocial health of VTS operators. The initiative drew significant participation from operators, providing valuable data through wearable technology. Analysis revealed a correlation between traffic density and mental energy consumption, highlighting Sector Donk as the most affected area. The project led to strategic adjustments in workforce deployment and psychosocial health management, contributing to enhanced operational efficiency and workplace wellness.

## Purpose of the document

The purpose of this input paper is to provide information for the VTS Committee when developing the guidance for dealing with stress and trauma in VTS operations.

## Related documents

**IALA VTS55 – 6.11** VTS Task Plan 2023 – 2027

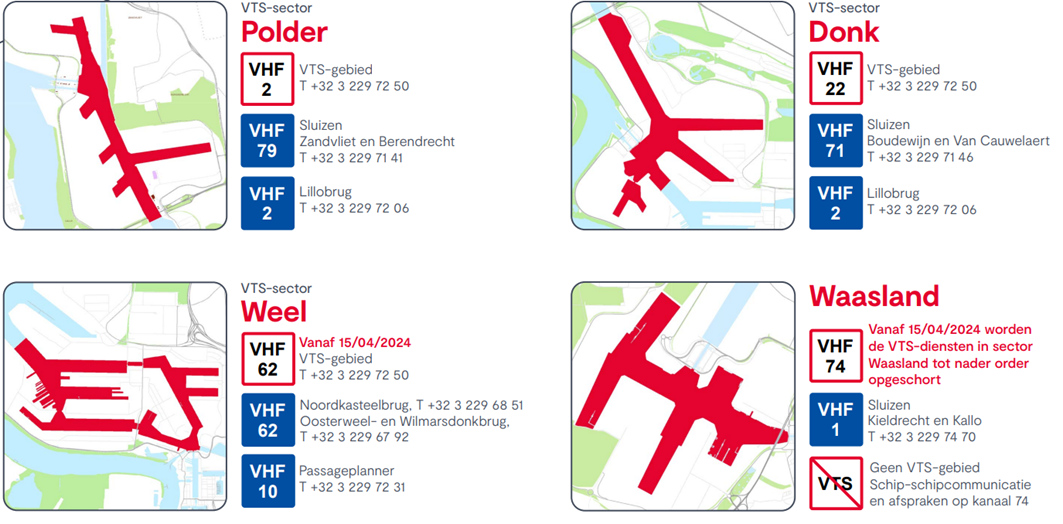
**G1171** Human Factors and Ergonomics in VTS

**G1156** Recruitment , Training and Certification of VTS Personnel

# Background

The Port of Antwerp-Bruges, handling around 300,000 vessel movements annually, initiated a pilot project to investigate the psychosocial impacts of such high traffic on its VTS operators. The project was motivated by the necessity to understand and mitigate the mental strains faced by operators in three critical VTS sectors: Waasland, Polder and Donk. With the aid of the BioRICS Mindstretch© system and Fitbit devices, the project collected continuous physiological and psychosocial data from the operators.

# Discussion



1. VTS Port of Antwerp – Bruges has 4 VTS sectors : sector Waasland , Sector Polder , sector Donk and sector Weel .

The project has had a positive impact on the participants. A large percentage of the VTS operators of PoAB participated in the project, even in their personal time. The participants showed great perseverance, as the fitbit was worn consistently during the initial months. This high level of engagement resulted in sufficient data for relevant reporting.

## METHODOLOGY

* Background

“Mindstretch” is a commercially available software (BioRICS NV, Belgium) specialized in real-time algorithms for monitoring individual humans and animals to improve their health and well-being. These algorithms take into account that all living beings are very complex, individually different, time varying in their responses and dynamic. The algorithms adapt to each individual and to his/her time varying behavior and responses.

In the project the participants wore a “Fitbit” (wearable) that was connected to the software “Mindstretch” for monitoring heart rate and movement throughout project participation. By using movement and heart rate, the software is able to separate the different heart rate components: basal, mental and physical. Since aerobic metabolic energy is proportional to the heart rate, it is possible to monitor the mental metabolic energy in function of time.

* Rationale of the project

The psychosocial health is key priority, therefore Port of Antwerp-Bruges wants to give their workers insights in their metabolic energy use. It is relevant to know which activities are asking/burning metabolic energy and activities that are giving energy/allowing the person to recover or gain metabolic energy.

* Primary objective

The primary objective was to investigate the mental metabolic energy of the VTS-operators during the work. To avoid people making mistakes, it is important to prevent very high workloads or high mental metabolic energy use for a prolonged period.

* Secondary objective

The project included 4 different phases:

* + Phase 1: To get users to know the system.
  + Phase 2: Monitoring of the participants where the participants do not see their results.
  + Phase 3: Monitoring of the participants where the participants see their results.
  + Phase 4: Monitoring of the participants with advice to improve mental energy use/recovery.

## Findings

* A positive correlation was found between traffic density and mental energy consumption. During weekdays, the mental energy consumption during the day was higher than during night shifts (Infographic 1).
* There were also larger variations in balance scores during weekdays compared to weekends, as peaks in traffic density are less frequent on weekends (Infographic 2). There was also a distinction in energy consumption among different VTS sectors, with the busiest sector, Sector Donk, requiring the highest energy consumption followed by Sector Polder (Infographic 3).
* The Importance of general psychosocial factors such as sleep, nutrition, exercise, and rest was emphasized. Particularly striking was the significant impact of sleep on the overall energy balance score of the employees (Infographic 4). There was no significant difference in mental energy consumption during screen recuperation compared to energy consumption during operations (Infographic 3). Possible causes for this include mental decompression, the constant presence on the work floor, and it being the only time to attend to other matters.

## Strategic Outcomes and Future Initiatives

Based on these findings, several actions have been implemented and planned. These include increasing the workforce occupancy in response to increased traffic density (Sector Weel instead of Sector Waasland), providing a stimulus-free rest space, and organizing a training/workshop on sleep (in combination with shift work) for PoAB VTS ( OP/NO/VTS ) in the autumn of 2024.

The project has brought added value to the VTS by consolidating planned operational actions and building knowledge within the SHEQ department about the VTS department for future prevention. Thanks to the project, there is now a shorter line of communication between VTS and the external confidant Bart of EDPB Mensura ( External Service for Prevention and Protection at work ) .

For the PoAB, the project has broken the ‘‘taboo’' surrounding psychosocial health among senior management. The SHEQ department is using the findings from this project as the foundation for the future global SHEQ policy within PoAB.

The data from the pilot project clearly demonstrated that mental energy consumption among VTS operators is significantly influenced by the density of vessel traffic, with higher consumption during peak traffic times, (particularly in Sector Donk).

The findings prompted several strategic interventions, including reallocating workforce based on traffic intensity and establishing stimulus-free zones for rest.

Additionally, a workshop on sleep management in relation to shift work is planned to further support the operators' health.

### Figures

85% of the VTS team participated.

17/35 participants shared their data with the external confidential counselor from EDPB Mensura and therefore believed in the potential added value of personal coaching.

### Infographics

Afbeelding met tekst, schermopname, diagram, Lettertype

Automatisch gegenereerde beschrijving

1. Mental energy consumption per sector (Peña Fernández, A., Vandecasteele, K. & Berckmans, D. (2023). MINDSTRETCH – REPORT FOR PORT OF ANTWERP BRUGES. BioRICS N.V., p. 17)

Afbeelding met tekst, schermopname, diagram, lijn

Automatisch gegenereerde beschrijving

1. Higher mental energy consumption during week than during weekend (Peña Fernández, A., Vandecasteele, K. & Berckmans, D. (2023). MINDSTRETCH – REPORT FOR PORT OF ANTWERP BRUGES. BioRICS N.V., p. 21)

Afbeelding met tekst, schermopname, diagram, Lettertype

Automatisch gegenereerde beschrijving

1. Mental energy consumption (by time) per sector (Peña Fernández, A., Vandecasteele, K. & Berckmans, D. (2023). MINDSTRETCH – REPORT FOR PORT OF ANTWERP BRUGES. BioRICS N.V., p. 17)
2. p. 14)

Afbeelding met tekst, schermopname, diagram, Lettertype

Automatisch gegenereerde beschrijving

1. Impact of sleep on the overall energy balance score (Peña Fernández, A., Vandecasteele, K. & Berckmans, D. (2023). MINDSTRETCH – REPORT FOR PORT OF ANTWERP BRUGES. BioRICS N.V., p. 14)

# Action requested of the Committee

The Committee is asked to review the information provided in this document and proceed with suitable action.

1. [↑](#footnote-ref-1)