

Integrating
Human Factors
in European Railways
**Safety Management
Systems**

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What is 'Human Factors'?

Human Factors concerns the optimisation of human performance in the workplace for the purpose of safety, well-being and efficiency.

It considers the working environment from a human-centred viewpoint, looking at the whole system and its influence on the way people behave and interact with the railway.

Human Factors (HF) focusses on the 'fit' between the user, equipment and their environments.



The individual is at the centre of the socio-technical system. (Courtesy of RSSB)



Why 'Human Factors' are important?

'Human factors' play an increasingly important role in modern complex, safety-critical systems.

Even when some processes are automated – often as a measure to reduce human error – people are an essential part of European railways.

People are at the centre of this technological, social and organizational system and are the key to success or failure.

Safety Management Systems

The railways are facing significant challenges in the near future:

The implementation of ERTMS will bring significant changes to the work of train drivers and signallers; the automation of railway tasks

is gathering pace bringing the need for training new skills, older workers are retiring and there is the need to maintain worker competence and train a new generation of staff, who will be interacting with the new technology.

The safe and effective operation of the European railways depends on the people working at all levels of the system. Most of the processes within the SMS will influence the working conditions and environment of railway workers; therefore, it is essential that HF knowledge and methods should be integrated into the SMS. The fundamental principle of human-centred design with worker participation should be established within the railway SMS processes throughout the life-cycle of the system.

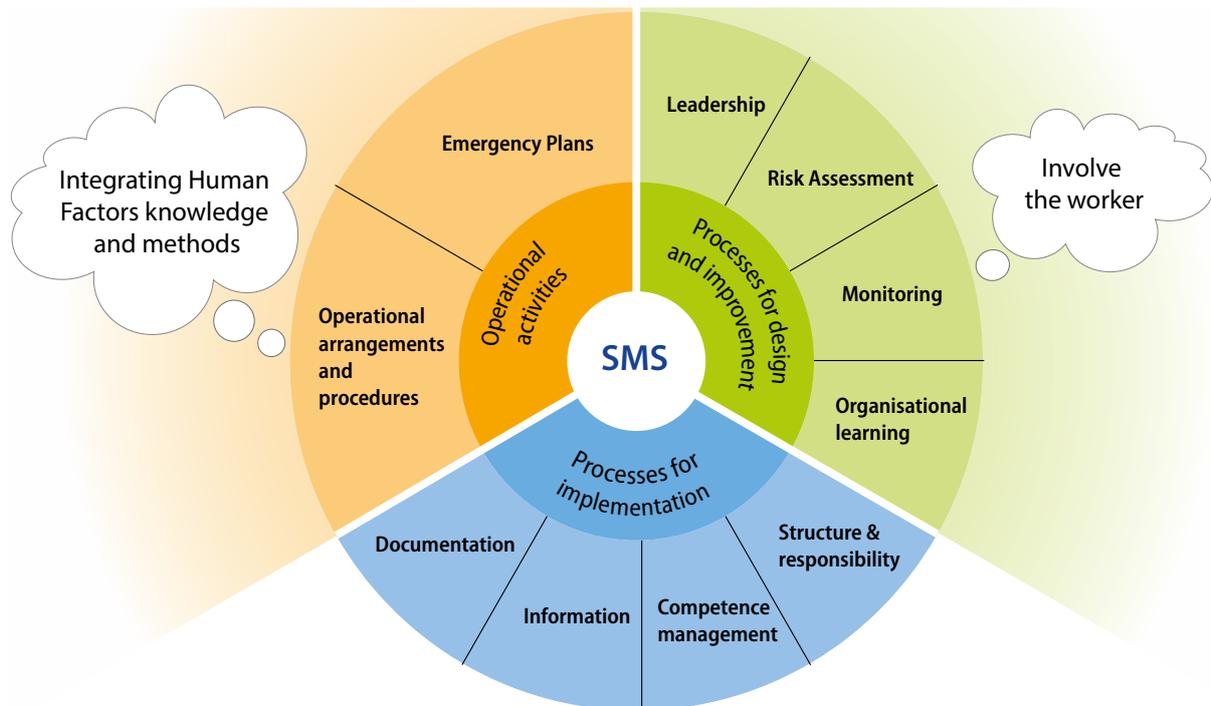
The benefits of integrating HF into SMS are:

- improved safety, well-being and satisfaction
- effectiveness and efficiency.



Safety Management Systems (SMS):

Change management... Risk assessment... Competence management...



The National Safety Authority (NSA) in each Member State is responsible for assessing the SMS of the Railway Undertakings (RUs) and Infrastructure Managers (IMs) before issuing the Safety Certificate or Safety Authorisation.

The NSA supervision strategy will identify the key operational risks and focus on how the RUs or IMs manage these risks. Examples are: training drivers to maintain their competence to prevent SPADs; procedures that prevent someone driving when under the influence of alcohol or drugs, and good shift regimes to reduce fatigue.

The SMS is really only a tool; the whole organization must share the beliefs, values and behaviours for safe working on the railways - the safety culture.

"A strong Safety Culture is generally considered as a vital condition to a well-functioning SMS. It is sometimes said that it is well possible to have a good Safety Culture without a formal SMS, but it is not possible to have an effective SMS without a good Safety Culture." (1)

(1) EASA Safety Culture Framework for the Ecast Sms-Wg

A safety culture will grow and evolve where there is a strong management, where there is active involvement of the workers, and where there is trust and cooperation at each level of the organization.



European Union Agency for Railways

120 rue Marc Lefrancq
BP 20392
FR-59307 Valenciennes Cedex
Tel. +33 (0)327 09 65 00

era.europa.eu
Twitter @ERA_railways

* Following the entry into force of the technical pillar of the 4th EU Railway Package (Reg. 2016/796), the European Union Agency for Railways replaces and succeeds the European Railway Agency. The change of name requires also a new corporate design. The "Agency" refers as from now to the European Union Agency for Railways. However depending on the context, some parts of this brochure still refer to the former European Railway Agency.

For more information, please visit:

- <http://www.era.europa.eu/tools/sms/>
- <http://www.hse.gov.uk/humanfactors/>
- <http://www.sparkrail.org/Pages/HumanFactors.aspx>
- <http://www.vbg.de/>

Other leaflets about Integrating Human Factors in European Railways, also in other languages:

- Incident and Accident Investigation
- Information for workers

Search for 'Human Factors' on www.era.europa.eu

Making the railway system work better for society.



Publications Office

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