Special issue for Cognition Technology & Work journal: 
The role of human factors for sustainable and resilient rail systems

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Individual and collective accidents in the transport domain are due to multiple combinations of various technical, organisational, human and contextual factors. Approaches initially focusing on the removal of human errors have been gradually replaced by more systemic visions focusing on latent failures or on the complex interactions between the different dimensions of the system (human, technical and organizational). While analysing errors or violations is useful and necessary for preventing unwanted identified events and protecting against outcomes, this reactive approach is insufficient to guarantee safety. Indeed, as time passes, new situations and behaviours that could not be predicted are emerging. Furthermore, it has been increasingly recognized that humans can also contribute to avoid or recover risky situations, contributing thus positively to the resilience of human-machine systems. This obviously applies to the railway systems. Feedback on the regular use of dead-man system such as VACMA highlights the limitation of the technology and the capacity of human drivers to activate it when they are drowsy or experiencing micro-sleeps. The design process of such a support tool for the railway system has then to take into account possible unplanned or additional user behaviour in order to assess the associated risks and adjust the technology accordingly. Research on big data, knowledge discovery, cyber-physical and human systems, system security, risk analysis, user-centred design, automation-supported human activity, human-supported automation, cooperative systems, autonomous driving, accidentology, safety performance as it varies between rail networks, safety culture and smart barriers can contribute to addressing and controlling the risks resulting from human error. Moreover, the fragility of a railway system depends also on the occurrence of external events such as natural disasters or wilful negative acts such as terrorist attacks. The role of human operators needs to be defined so as to make the railway system resilient to various risks and threats by considering transverse research topics such as human and national cooperation, positive and negative human contributions, individual and organisational dissonance, crisis communication, cooperation and learning from the past, and decision support system. This special issue seeks submissions from researchers and industry employees who work on these challenges related to human factors, cognitive engineering and social sciences dedicated to the lifecycle of railway systems, from the design of infrastructure or trains to their dismantling and recycling.

The special issue is organized with the collaboration of several research groups:

- GRAISyHM (Research Group on Integrated Automation and Human-Machine systems)
- GDR I HAMASYTI (International Research Group on Human-Machine Systems in Transportation and Industry)
- GDR MACS (National Research Group on Modeling, Analysis and Control of dynamic Systems)
- HORTENS (Human Factors, Cognitive Engineering and Social Sciences) pole of EURNEX (European Rail Research Network of Excellence)

Contributions have to respect the aims and scope of Cognition Technology & Work.

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