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Title of presentation Developing trainings to improve cognitive skills of technical operator in the railway domain	Institution University of Applied Sciences Northwestern Switzerland
Please highlight workshop topic(s) your paper is relevant for <input type="checkbox"/> Human Factors Integration (e.g., in organizational processes) <input type="checkbox"/> Others: Trainings	
Abstract <p>Technical operators in the railway domain are experts responsible for the supervisory control of the traction power network as well as of the railway tunnels. The technical systems used to face these demanding tasks are constantly increasing in their complexity. To carry out this complex activity, it is essential that they have the necessary expertise, not only to master the execution of their own activity under normal conditions, but also to be able to react appropriately to unexpected events. To achieve this, the technical operators must be trained beyond the basic training in which they are educated in terms of technical knowledge and working with guidelines. Trainings to improve the cognitive skills required by technical operators are still lacking in Switzerland. Our team of the University of Applied Sciences Northwestern Switzerland together with a Swiss railway company, in a joint research project, developed trainings to improve the relevant cognitive skills of technical operator in the railway domain.</p> <p>In a first step, we conducted observational interviews to analyze the tasks of technical operators. In a second step, we applied a "Cognitive Task Analysis" (CTA) to identify the cognitive skills that the operators need to perform their tasks. In a third step, we grouped these cognitive skills in order to identify training topics for which the trainings should be developed. The resulting most relevant training topics are: (1) establishing mental models, (2) communication, (3) teamwork, (4) practical rehearsal. For each of these training topics, we defined specific goals that should be achieved by technical operators through the participation to the trainings. All defined goals related to three main categories: knowledge, skills and attitude. Only by considering all three categories, it can be ensured that achieving the goals leads to the theoretical understanding of the desired behavior, the ability and the willingness to really implement it in the work setting. Based on the goals defined for each of the identified training topic, we could finally develop trainings able to improve the relevant cognitive skills of technical operator.</p> <p>For each training topic, we developed two types of trainings: off-the-job trainings and on-the-job trainings. Off-the-job trainings are conceived to be carry out outside of working hours. These include presentations of theoretical content of the training, practical exercises with which the relevant skills can be acquired, and group discussions to support the transfer into the daily work routine. The on-the-job trainings consist of exercises that the technical operators can carry out during their working hours, independently or in consultation with instructors. All taken together, the participation to these trainings allows technical operators to achieve the defined goals, making sure that the relevant cognitive skills of their job are effectively trained.</p>	