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Title of presentation DB Regio's Safety Management System @ half waypoint	Institution DB Regio AG
<p>Please highlight workshop topic(s) your paper is relevant for</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ergonomics and Usability of advisory and assistance systems <input type="checkbox"/> Automation, Train control systems <input type="checkbox"/> Fatigue, monotony, mental workload <input type="checkbox"/> Risk, Human error and Human reliability <input type="checkbox"/> Situation awareness <input type="checkbox"/> Incident investigation <input checked="" type="checkbox"/> Safety culture <input type="checkbox"/> Human Factors Integration (e.g., in organizational processes) <input type="checkbox"/> Rules and Standards <input type="checkbox"/> others 	
<p>Abstract</p> <p>DB Regio is Europe's biggest passenger train operating company. With nearly 12.000 drivers we make around 300.000 scheduled stops each day. Our latest safety management system (SMS) was certified by the European Agency for Railways in late 2020. The first time for us to fulfil all the requirements from the 4th railway package including an ever stronger safety culture approach and human factors presence. It is no secret, that international exchange of best practices between DB Regio safety experts and our partners in fellow railway companies including via CER, UIC and ERA have helped markedly with the then new SMS. We are now half way through the duration auf this SMS. What a good opportunity to give an inside view at the half way point.</p> <p>Therefore we are going to show a logical circle of safety requirements through to the operating staff and via the safety culture action plan and back into the starting point. In other words a "plan do check act circle" improved by the aspects of safety culture in a safety critical environment.</p> <p>Furthermore, we are bringing in the perspective of risk management and the need for a valid approximation of human reliability levels. In order to evaluate a complex man-machine-rulebook system and it's overall safety performance it's more and more important to take the human factor capability into account. We are taking this view on one of the most important indicators of railway safety, the signal past at danger (SPAD). This simply means a train is entering section of line which is not authorized for movement by this train. Depending on overlap and emergency brake application and other trains possibly moving in that block section this might result in an accident, for example a collision. We wanted to analyze the different characters of rail networks operated by DB Regio with regard to the relative number of SPAD. Match this with the rate of restrictive signal aspects and therefore a requirement for the driver to react correctly and you can receive a reliability rate. It's becoming possible to approximate the human reliability based on the number of a train protection system traps versus the number of restrictive signal aspects triggering a train protection system acknowledgement. This is very much an add on to the work</p>	

of the late Dr. Hinzen and highly useful in our view, too.

Based on these new insights into various trigger points for human reliability in railway safety, human factors and fairness guide projects of the safety culture action plan come to fruition. In parallel, we are working on an ever higher number of non-technical skills training. See a 2021 example of risk triggered commentary as-is widely recommended towards driver managers, instructors and drivers. Not a common approach for the German mentality, maybe, but it is encouraging to hear it more and more in use. After all it was common in the steam age for firemen to call out signals to drivers and improve signal sighting / recognition in less than ergonomic visibility of today.