



► **2.2.343 – Competence retention for non-routine tasks in digital working environments (KONDITION) Studies on the basis of the occupation of chemical technician and pharmaceutical technician**

Research project: Abstract

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Key points in brief

Industry 4.0 is conflating industrial production with modern information and communications technology and is altering the role played by humans in the manufacturing process. This new role consists of usually defining a production strategy and monitoring its implementation in the (largely self-controlled) production processes. The result of this is that the employees affected (operators) carry out tasks which require a significantly lower level of skill than that they usually acquired in their training. However, quite the contrary applies during so-called non-routine situations (malfunctions, resets), which can regularly occur even in a highly automated production system. In such circumstances, the operators need to mobilise a wealth of knowledge and skills to make decisions rapidly and competently and to take action.. The problem caused by the automated processes is that the knowledge and skills needed in precisely this non-routine case have not been required for periods of a longer or shorter duration. For this reason, like all knowledge and skills, they are prone to the risk of being forgotten or of no longer being capable of activation (quickly enough).

This difficulty of loss of competence is referred to in the English-speaking countries as “skill decay” and was described at an early stage for operators in the fields of aviation, the military, the police and critical infrastructure (e.g. nuclear power stations). This is because these areas frequently contain time-critical systems, and the consequences arising due to erroneous action caused by skill decay are catastrophic in some cases.

With the advancing digitalisation and networking and the increasing transition to real-time systems this problem is increasingly being perceived in production, but corresponding studies focusing on this topic have not yet been carried out. The present research project seeks to close this gap and provide first of all for the two professions of chemical and pharmaceutical technician a comprehensive qualitative and quantitative description of the workplaces, tasks and competencies where "skill decay" occurs. In a second step, possible solutions will then be identified on the basis of existing measures and subjected to an initial practical test.