On-the-job training for process operators as a strategy for competence achievement - A case study

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Abstract

The technical development in complex and highly automated production processes affects the process operator's work and the demands on the operator. Two significant problems are difficulties in acquiring and maintaining the necessary competence and a risk of understimulation, since a stable process does not generate many active tasks, largely because of a higher degree of automation. In this case study, we were able to make a comparison between an approach to job design for solving these problems and a design of two existing operator jobs. The results suggest that this approach might be effective in practice.

Introduction

In this paper we discuss aspects of training and learning, mainly applied to process operator work. Some results from a case study will be discussed.

The role of the human operators in modern, complex systems requires a high degree of competence. The decisions they make have serious consequences, from economic, environmental and safety points of view. Bainbridge (1987) states that the higher the level of automation is, the more important the role of the human operator becomes, but at the same time it becomes harder to achieve and maintain this competence. This is explained by the fact that the operator's work tends to increasingly consist of monitoring tasks.

There are various ways of achieving and maintaining competence at work, each having it’s particular advantages and disadvantages, for example formal education, simulator training and on-the-job training.

Simulator training makes it possible to train workers for situations which cannot be tested in reality, for example for reasons of safety or economy. It also gives the operator a chance to train for events which seldom occur in the real work situation. There are, however, various limitations; it is both difficult and expensive to make a realistic simulation, and still only foreseeable situations can be built into the simulator. In order to be an efficient training tool, the simulator has to be based on extensive theoretical models. However, if these models were good enough, they