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Chemical and Nuclear Risks in the Light of Human Reliability Analysis

by

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The KFA is involved in a project about area risk analysis and planning. One subject deals with the transfer of probabilistic risk analysis (PRA) methods from nuclear power plant (NPP) to chemical plant applications.

This paper presents some interim results on the field of human reliability analysis (HRA). Two approaches have been performed already to gain insights for HRA applications to chemical plants.

Firstly, 82 incident reports from chemical plants in Germany (1965-1976) have been evaluated. 18 incidents were obviously caused by operators (i.e. post-design human interactions). From the 120 NPP incidents (reported for the same time period), 16 were obviously operator-caused. The evaluation of these 34 operator-caused incidents shows many interesting insights for chemical HRA applications, e.g. the high number of different types of chemical plants and the dynamic nature of many incidents in these plants.

Secondly, the insights of an HRA (performed with methods from NPP applications) for a specific chemical process have been evaluated. Some weak points are stated, e.g. the uncertain impact of the high frequency (> 1 per day) of procedures performed in chemical plants.

Finally, some research fields are outlined to develop methodological details for HRA applications to chemical risks.

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