

Doctorial thesis

**A methodology of Risk assessment
incorporating
Human Errors at workplaces**

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Abstract

A methodology of Risk assessment incorporating Human Errors at workplaces

The primary focus of the research reported in this thesis is to investigate and provide a means to evaluate risk of machinery including human error. The thesis suggests that human related aspects can be evaluated from looking at human error probability (HEP) and Performance Shaping Factors (PSF) as parameters to be observed. The research is motivated through approximately eighty percent of occupational accidents in Japan have unsafe acts as a cause. The basis of the research is the premise that human error can be examined and understood using “to err is human” and probability of error is heavily influenced through Performance Shaping Factors.

This thesis describes the development of risk assessment tools incorporating human error, while conventional risk assessment tools are for more hardware related hazard, and human related aspect have been overlooked. The aim of this study is to extend traditional risk assessment methods to include human-related aspects for easy and effective use of risk assessment by small-size company. The results of field study showed that the tools proposed here were considered useful because risk assessment of unsafe acts could be performed without consulting a human error expert, because no risk assessment tools incorporating human-related elements have been developed for small companies. Human error probability (HEP) and human error analysis (HEA)

have been used for large-scale, safety-critical industries for last three decades, but these tools are not suitable for smaller, more general industries that comprise the majority of accident settings.

Here, the research describes and verify a risk assessment tool that includes human-related elements for small companies. The tool expands on traditional risk assessment methods, such as matrix, risk graph and numerical scoring method, by adding human-related elements. The tool is easy to use in occupational environments, and includes assessments of human behavior and potentially outdated machinery at workplace.

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