ACADEMIC YEAR 2011 – 2012

TITLE OF DIPLOMA THESIS:

Human Error and Human Reliability Assessment Methods

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ABSTRACT

In the ensuing dissertation the methods of assessing Human Reliability are being analyzed. It is about a width analysis of the main and most representative methods, such as those identified in the literature. The basic methodology for implementation is being identified as much as the advantages and disadvantages. The key challenge is to identify those methods which are quasi suitable for application in geotechnical or major construction projects in both the design and construction phase and the operation and management of the project.Prerequisite to enable the reader to understand the philosophy of these methods is to familiarize with concepts such as what is the human error and how is it defined by a number of researchers and scientists, how many types of errors and violations exists and how are classified. For this reason, special attention is given to the analysis of these concepts and categories and the various classifications of errors.Equally important is to describe the context in which these methods are applied and generally is known as the Human Reliability Assessment or HRA. It is a key 'tool' for estimates of the likelihood of a risk (Probabilistic Risk Assessment) to occur in some activity or project under implementation and aims to scientifically predict probabilities of the human factor, in this activity or project, to exceed some acceptable limits, otherwise known as mistakes. This is reflected in the possibility of human error or HEP (Human Error Probability).From the 13 methods that are being presented the majority is of nuclear and chemical sector. The necessity of assessing the reliability of the human factor scientifically, began after the tragic accidents at nuclear power plants of Three Mile Island (1979) and Chernobyl (1986) and spread to other vulnerable sectors such as aviation and space exploration. In literature there are references to methods which are reported in the construction sector, however not any specific method was found.In conclusion, some of these methods can be used for human reliability assessment in large construction or geotechnical engineering projects either without changes or with some suitable modifications. The most suitable methods for this purpose after comparative analysis is the HEART, THERP, PC and CREAM methods, in descending order.

KEYWORDS

Error, Human Factor, Human Reliability Analysis, possibility of human error, human reliability methods.