

# Human error assessment in electric power company of Serbia

Evica Stojiljkovic<sup>a,\*</sup>, Miroljub Grozdanovic<sup>b</sup> and Predrag Stojiljkovic<sup>c</sup>

<sup>a, b</sup> Faculty of Occupational Safety, University of Nis, Carnojevica 10a, 18000 Nis, Serbia

<sup>c</sup> Economic Association for Electric Energy distribution "Jugoistok" d.o.o Nis, Branch ED Nis, Bulevar dr Zorana Djindjica 46a, 18000 Nis

**Abstract.** This paper presents a case study which confirmed that the use of APJ for proper assessment of human error in the Electric Power Company of Serbia (hereinafter EPS). The proposal methodological framework was used for human error identification and quantification in the case of a repair intervention on a steel lattice tower 10/0.4 kV (jurisdiction of an EPS subsidiary ED "Jugoistok", Nis, Serbia) which resulted in an accident with a fatal outcome. One of the aims of this study is to show the necessity of human error assessment not only in manufacturing industries but, as it will be shown in this paper, in companies that distribute electric energy, as well.

Keywords: Human Error, Human Error Assessment, Absolute Probability Judgement, Risk Assessment, Industrial accident.

## 1. Introduction

Intensive development of methods for human error assessment has started after numerous accidents caused by human errors, or after inadequate actions of the people who were either controlling or managing complex technological processes. Analyses of the accidents in Chernobyl, Bhopal, Three Mile Island, etc., have proven the significance and necessity of human error study. Human error was the cause behind 80% of all major accidents.

In a number of foreign and domestic research papers, methods used to assess human error, based on expert assessment, are analyzed. These are the following methods: Absolute Probability Judgement - APJ; Paired Comparisons - PC; Human Error Assessment and Reduction Technique - HEART; Technique for Human Error Rate Prediction - THERP; Success Likelihood Index Method - SLIM; Influence Diagrams Approach - IDA; Human Cognitive Relia-

bility - HCR; Technica Empirica Stima Errori Operatori - TESEO, etc.

Evaluation of these methods was based on the evaluation of the following quantifiers: accuracy, validity, usefulness, effective use of resource, acceptability and maturity. The best rated methods are HEART, APJ, THERP, SLIM, slightly lower rated methods are PC and IDA, and the lowest rated are methods TESEO and HCR [4, 5].

In Serbia in the past, there was not an adequate approach to this issue and little attention was devoted this research. The existing solutions are based on very simplified requirements, and some of the methods were applied in the analysis of human reliability in coal mines with underground mining and centers for control and management of automated systems, so that there are few written data on the assessment of human error by domestic authors. However, M. Grozdanovic and E. Stojiljkovic, applying a systematic and synergistically methodological approach in the last five years, a significant number of papers have been published in this domain.

\*Corresponding author. E-mail: [evica976@gmail.com](mailto:evica976@gmail.com); [evica.stojiljkovic@znrfak.ni.ac.rs](mailto:evica.stojiljkovic@znrfak.ni.ac.rs)

Evica Stojiljkovic, Ph.D, University of Nis, Faculty of Occupational Safety, Carnojevica 10a, 18000 Nis, Serbia, phone: +381 69 14 87 031