

عنوان مقاله:

Human Injuries Risk Assessment of Medium Voltage Electrocutation using Bow Tie Model in Fuzzy Environment(Case
(Study: Golestan Province Electricity Distribution Company

محل انتشار:

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نویسندگان:

Mohammad Mehdi Babaei - *Industrial Safety Department, School of Health, Safety and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran*

Mousa Jabbari - *Industrial Safety Department, School of Health, Safety and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran*

Ahamd Ali Babaei - *Industrial Safety Department, School of Health, Safety and Environment, Shahid Beheshti University of Medical Sciences, Tehran, Iran*

خلاصه مقاله:

Individuals involved in development, repair and maintenance activities of power transmission and distribution are at high risk of electrocution. The purpose of this research is to calculate the human injuries risk of medium voltage electrocution accidents using Bow Tie model in fuzzy environment. Therefore, existing evidences and documents was investigated, and accident causes was determined using the FTA technique. Then, their outcomes were identified by using ETA and William Fine method, and Bow Tie diagrams were drawn based on the results. After that, because of inadequate data, the fuzzy logic was used to calculate the probability of the root causes and outcomes of the accident. The probability of the middle causes and top event was also calculated by probabilistic equations. The results showed that in terms of frequency, medium voltage electrocution accident with probability of $2.2E-4$ is one of the significant accidents in the electricity distribution activities, as well as the outcome of permanent total disability or death of one person and with no injury, are the maximum and minimum outcome of the mentioned accident with the probability of $2.1E-6$ and $1.29E-10$, respectively. These outcomes with the risk of $1.05E-8$ and $1.29E-10$ are also considered as highest and lowest risk, respectively. Permanent total disability or death of one person is the most important outcome of medium voltage electrocution accident, in terms of both frequency and risk. Lack of installing earth system and absence of double insulation are the most important root causes of accidents. Finally, the results of this research can facilitate financial and human resources planning, and also, the use of Bow Tie in the fuzzy environment can resolve risk assessment problem greatly in the uncertainty and lack of inadequate data.

کلمات کلیدی:

Power Distribution, Medium Voltage Electrocutation, Risk, Fuzzy Bow Tie, Human Injuries

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