

عنوان مقاله:

Power Plant Project Risk Assessment Using a Fuzzy-ANP and Fuzzy-TOPSIS Method

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خلاصه مقاله:

Economic growth in developing countries has led in increasing demand for infrastructure projects like power plants. In order to respond to these development needs, the government of Iran has engaged several companies to carry out power plant projects. While many papers have been published on the subject of project risk management, little information exists on the actual use of risk management in practice. The primary objective of this paper is to identify and rank the risks in these power plant projects. The proposed model allows risks to be ranked based on management priorities using a combined fuzzy analytic network process (fuzzy-ANP) and fuzzy Technique for Order Preference by Similarity to Ideal Solution (fuzzy-TOPSIS) method. In classical approaches, Probability and Impact are two commonly used criteria in project risk ranking. However, these criteria do not sufficiently address all aspects of project risk. Moreover, there may be relations and dependencies among the various criteria. Therefore, we proposed a hierarchical structure for ranking risk in power-plant projects. The proposed structure can consider dependence among the different criteria. We use fuzzy-ANP for calculating weights. The outputs of fuzzy-ANP calculations are used in a fuzzy-TOPSIS procedure for the evaluation of important risks. A case study of a power plant project is presented to demonstrate the applicability and performance of the proposed model. More than 100 risks were identified and categorized according to their source and to their relative impact on the project. We evaluated important risks using the fuzzy-ANP and fuzzy-TOPSIS method. In addition, we used a sensitivity analysis to discuss and explain the results of the method. The proposed method is a suitable approach when performance ratings and weights are vague and imprecise.

کلمات کلیدی:

Risk Identification, Project Risk Assessment, Fuzzy-ANP, Fuzzy-TOPSIS, Power Plant Project, Engineer-Procure-Construct Projects

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