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Risk Assessment in Indian EPC Contracts

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Abstract

The construction industry plays a major role in the economic growth of a nation and occupies a pivotal position in the nation's development plans. Engineering, Procurement, and Construction (EPC) contracts have become the dominant delivery model for large and complex infrastructure projects across the globe. The need for single-point responsibility, schedule certainty, and better risk allocation drives it. But improper risk management across engineering, procurement, and construction stages results in delays, cost overruns, and performance disputes, making it riskier. This research develops a systematic risk assessment by integrating an extensive literature review, structured risk identification, and a questionnaire-based survey aligned with EPC project life-cycle stages. Extensive literature review was conducted and identified 74 major risks associated with Indian EPC sector which were refined to 31 critical risk and classified across engineering procurement and construction stages and validated with pilot survey. A large-scale questionnaire survey was administered to more than 120 EPC experts to evaluate the frequency of occurrence and severity of impact of each risk. Relative Importance Index (RII) values were calculated by integrating frequency and severity measures, enabling quantitative prioritisation of risks and calculated scaled risk exposure to each phase. The results provide clear insights into stage-wise risk concentration, identifying project phases that require greater managerial focus and control. The findings assist owners and contractors in allocating resources and strengthening risk mitigation strategies, while also offering investors a structured basis to evaluate relative risk exposure across EPC projects and sectors.

Keywords: Risk Assessment, Indian EPC Contracts, Engineering Risk, Procurement Risk, Construction Risk