



2nd National Conference on Applied Researches in Structural Engineering and Construction Management



Application of Failure Mode Effects Analysis (FMEA) in High-Rising Building Construction

Mohammad Reza Asadi¹, Hassan Zoghi^{2,*}, Mahdi Habibi³

- 1- Department of Civil Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran
- 2- Assistant Professor, Department of Civil Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran, h_zoghi@kia.ac.ir
- 3- Assistant Professor, Department of Civil Engineering, Karaj Branch, Islamic Azad University, Karaj, Iran

ABSTRACT

Every construction project might face with some problems and risks. There are many different methods to identify risks and manage them before happening. In this research, we try to use an industrial method that called Failure Mode Effects Analysis (FMEA) to identify risks and their priority numbers. With this type of classification, it will be possible to rank risks of building construction and find effective and on time reactions for them. We used 25 high-rising buildings in Tehran as case studies and asked 100 respondents to answer questionnaires. Results have shown that FMEA is not as a familiar method to identify and rank risks in these kinds of buildings and there are some important barriers to use it. This research has gathered some effective factors to spread application of FMEA in risk management of high-rising building constructions.

Keywords: FMEA, High-rising, Building, Construction, Risk.

1. INTRODUCTION

Risks in every project must be considered by managers and other members of it. Effects of risks are different and their intense can impact success of every process in project or the final results and aims of project. There are many different kinds of risk which should be considered and identified. Sometimes, it is hard to identify risks and decision makers in projects, need to have suitable ways to recognize them. One of the famous and strong methods in risk ranking and identifying is Failure Mode Effects Analysis (FMEA). This method is generally used in industry and producing goods in factories. In this research we try to use this method in building construction and high-rising buildings. Based on literature review, this method is used for industrial processes or in limited parts and processes of construction, but we have tried to use this method in ranking and identifying all kinds of the risks of construction project. Therefore, managers can use data and analysis for whole of the project risks as a main method of risk management of construction project. Some important questions that will be addressed in this paper are as follows: how to identify the factors that causes of risks, how to use FMEA method in building construction, what are the main barriers in using FMEA in building construction, and how much managers are aware of this method and its benefits in construction. The construction industry is undertaken at all organizational levels, dynamic, risky, challenging, and rewarding fields. Such organizational and technological complexity generates enormous risks [1]. Unfortunately, the construction industry has a poor reputation in risk analysis when compared with other industries such as finance or insurance [2]. Many projects suffer from poor identification and inadequate risk analysis [3]. Each project has many associated risks and these risks vary between projects, depending upon technology, financial, legal, construction site, the size of project, the stage in the project life cycle etc. However, the key sources of project risks are essentially the same, and the variations in investigating risks are considerable. Nonetheless, risk management implementation should be emphasized and improved. Thus, to make the benefit of risk management to the participants of construction projects, model for investigating risk factors affecting project success should be investigated. The main objectives of this paper are to use FMEA method in building construction risks and identify barriers of using it. Besides we have tried to rank main solutions to assist managers in using this risk method.

2. LITRETURE REVIEW

Risks of projects may have prominent impact in success of a project. Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project aim such as schedule, cost, quality, stakeholders, and financial situation. A risk may have one or several causes and, if it occurs, it may have one or more effects on project. Every project needs project risk management to be prosperous in facing with risks. Project risk management includes the processes of