

Research of Risk Assessment Technology for Long-span Bridge

Jie ZHANG

PH.D. Senior Engineer
CCCC Highway
Consultants CO.,Ltd.
Beijing, China
Spanje77@gmail.com

Gao LIU

Department Manager
CCCC Highway
Consultants CO.,Ltd.
Beijing, China
Liugao77@163.com

Junli ZHAO

Department Manager
CCCC Highway
Consultants CO.,Ltd.
Beijing, China
zhaojunli@vip.sina.com

Jianlei CHEN

Civil Engineer
Guizhou Communication
Design Institute
Guizhou, China
Sxrb2816@163.com

Summary

Risk assessment technology is very important to improve the bridge construction and operation of the safety level, and to reduce the risk loss. This paper summarizes the main advances in risk assessment technology of bridge at home and abroad. This paper elaborates the key technique system of long-span bridge risk assessment at the recent years and the problems that are needed to solve urgently, the comprehensive assessment of standard system, and risk assessment method, technology, results, conclusion of long-span Bridge. The major technical and the key common technical are integrated comprehensive. The applications of risk assessment achievements in the typical project have important practice significance.

Keywords: risk, assessment system, assessment criterion, assessment method, assessment procedure.

1. Introduction

There are many uncertainties in the design, construction and operation stages of long-span bridges. Any mistake or error in any stage will greatly reduce the safety of bridges and even result in all kinds of engineering accidents, including bridge collapse due to overloaded vehicles, bridge collapse due to ship collision, collapse of arches or girders under construction, and unexpected collapse of bridges after strengthening[1]. To deal with the increasing bridge accidents and loss of life and property, it is needed to improve the management system of bridge construction and operation, to make effective controls of bridge risks, and finally to ensure the safety of bridges. Therefore, it is urgent to carry out the study on risk assessment technology for bridge engineering in order to strengthen supervision of safety of construction projects, to establish risk assessment policy of design, construction and operation of bridge engineering, and to promote safety technology standardization progress of bridge engineering.

In China, the authorities, worthies, experts and scholars of bridge engineering show high concerns over related problems of technology, management and operation of risk assessment of bridge construction and operation[2][3]. With respect to the situations of China, the authors analyze in this paper the criterion, procedure, method and application of risk assessment, discuss some key problems on the basis and method of risk assessment, optimize and supplement risk assessment system, propose new method for engineering application with easy implementation, suggest stable and proper assessment procedure for general risk problems in bridge and tunnel engineering, improve basic assessment model, and enhance the efficiency and level of bridge risk assessment.

2. Risk assessment system

The essence of long-span bridge risk assessment is "reflected on the past, based on the present and predicted the future", that is to say, which reflects on the successful experience and failures of project construction and operation, focuses on the current state of project technology and