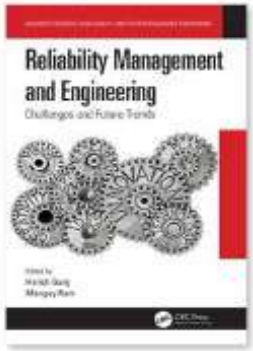

Chapter

Fuzzy Fault Tree Analysis for Web Access Failure under Uncertainty Using a Compensatory Operator

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Book Reliability Management and Engineering

Edition	1st Edition
First Published	2020
Imprint	CRC Press
Pages	26
eBook ISBN	9780429268922

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ABSTRACT

In most of the existing fuzzy fault tree analysis (FFTA) methods, basic events in the form of fuzzy numbers are connected through operators representing their interactions with each other and generally do not provide any compensation between small and large degrees of membership. So, this chapter proposed a novel FFTA method to evaluate fault interval of web access failure and ranked its critical basic events for managerial decision making. The proposed method uses FTA, basic events as triangular fuzzy numbers (TFNs), compensatory operator to connect basic events, and α-cut based fuzzy arithmetic operations to obtain fault and reliability intervals of the system. The use of the compensatory operator in the proposed method provides the flexibility to connect the fuzzy sets through a parameter. Based on the suitable choice of the parameter value, more realistic results can be obtained. In numerical verification, web access failure analysis has been conducted based on a real web server LOG data. The proposed fuzzy approach produces a more appropriate and flexible result compared to the traditional approaches.