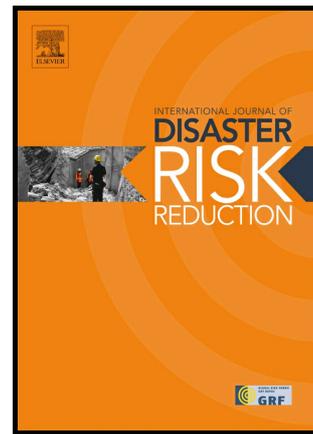


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Factor and Trend Analysis of Total-loss Marine Casualty Using a Fuzzy Matter Element Method

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Abstract

World shipping activities are operated in a complex and risky environment. The global marine casualty governance and shipping safety problems are issues of common concern of all maritime countries. Total-loss marine casualties are the nightmares and the most serious shipping accidents to the world, which may cause huge economic losses, the loss of lives, and severe marine environmental pollution. This study develops a fuzzy matter element method to analyse the main contributing factors of world total-loss marine casualty, the evolution trend of the total losses caused by different contributors is also evaluated with the proposed models. In this paper, according to the practice of the world shipping industry, we firstly select ten main contributors of the world shipping total losses, and the evaluation framework and mathematical models are established based on fuzzy matter element theory. Then the paper introduces the detailed evaluation procedures and methods. Finally, we select the historical data of world total-loss marine casualty from 2001 to 2015 for an empirical study of the proposed models, verifying practicability and validity of the method introduced in this paper. The results of this study are beneficial to government departments and policy makers in proposing reasonable and effective strategy to control and prevent the total-loss marine casualty in world shipping industry.

Keywords: Total-loss marine casualty; Fuzzy matter element method; Factor and trend analysis; Shipping safety

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