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Analysis on Influencing Factors of Emergency based on System Engineering

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Abstract

In order to confirm the factors and the relationship between them in the development of emergency, the System Engineering analysis idea and graphical expression of vensim are used to explore the factors of emergency. The study shows that the emergency evolution process consists of three subsystems: security technology, human resource and environment, which influences each other. And, only these subsystems strengthen coordination, they can improve the management of emergency.

Keywords: emergency; influencing factor; System Engineering

1. Introduction

Emergency is a collection of many events, which may cause social chain reactions and serious consequences, threaten social stability, also are invalid in normal disposal method and means, need many departments of the social's to cooperate [1]. As kinds of discrete random events, the evolution rule is extremely complex for there are so many uncertain factors in the emergency's prevention and control. But through the in-depth analysis of every emergency, the results show that the happen and disposal of it make up a complex system and show dynamics of System Engineering characteristics. Therefore, with the theory and method of the System Engineering, this article analyses the influence factors of emergency to understand the correlative and interdependence, multiple feedback relation among its factors, then discuss some effective measures and policy suggestions to deal with this emergency. It is of great significance for emergency management.

2. Factors and their relationship analysis of each System and Subsystem

Combined with the emergency evolution mechanism theory and the related research of System Engineering, we need to understand the main influencing factors and variables sets of the system. After analysing of an emergency, we can know the main influence factors are safety management concept, risk assessment, management information system, emergency source control, risk control investment and employee risk education, human resource management, employee organization mechanism, enterprise management mechanism and security facilities, etc[2] . In order to find the relation between each factor of an emergency development much more intuitively and comprehensively, we divide the emergency development system into three subsystems, the security technology

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subsystem, the human resources subsystem and the environment subsystem[3], then research them separately. The relations of them are as follows:

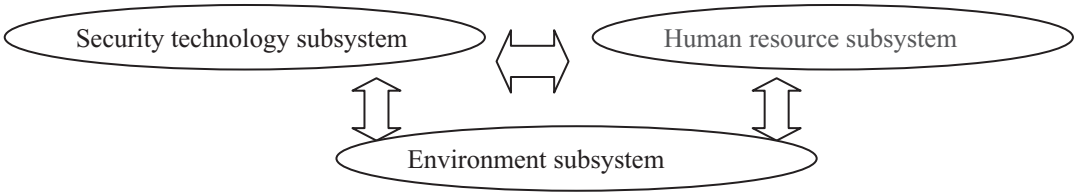

Figure 1 System structure of emergency safety management

2.1. Security technology subsystem

In the security technology subsystem, there are mainly four factors, the level of management Emergency, the level of safety facilities management, the level of emergency source control and the level of management information system. The level of emergency source control can improve the level of the emergency development, And the improvement of the subsystems level promotes the increment of the level of emergency source control; The improvement of the level of information management system makes emergency development level strengthen, which increases the increment of management information system level; The level of safety equipment management depends on two factors. One is the influence coefficient from configuration to the safety facilities management, the other is the influence coefficient from science and technology to the safety facilities management. They affect the emergency management together. Public daily operation mechanism and employee organization mechanism can also affect the management level of safety facilities. According to the principle of safety technology, a SD subsystem flow graph is shown as figure 2:

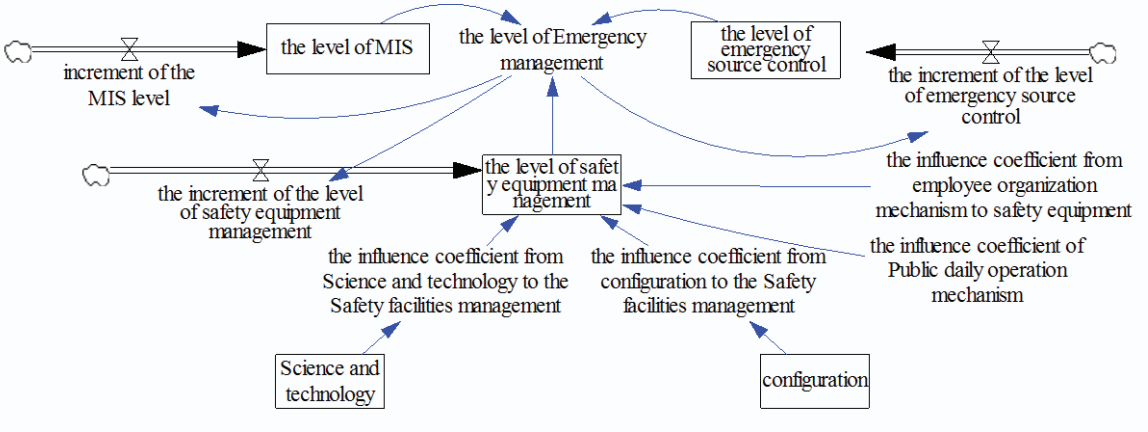

Figure2 Security technology subsystem

2.2. Human resource subsystem