Study of Building the Emergency Logistics Supply Chain based on the Reliable Technology

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Abstract. Emergency logistics is an important channel to provide important emergency and relief materials for public health events and sudden natural disasters. With the continuous development and improvement of social economy, improving the supply capacity of emergency logistics and improving the supply chain of emergency logistics are important ways to improve the level and capability of government rescue. In order to further guarantee the normal life of the people in the affected areas and promote the stability of the social environment. This paper aims at the current development status of logistics supply chain and conducts in-depth exploration and analysis based on reliable technology.

Keywords: emergency logistics; rescue; supply chain.

1. Key Factors for the Construction of Emergency Logistics Supply Chain

1.1 Select the Enterprise's Qualifications and Capabilities

With the change and development of social environment, enterprises of different nature and categories have sprung up like mushrooms in different industries. Most of them are enterprises with balanced strength and ability, but there are also some enterprises with insufficient comprehensive ability. Therefore, in the construction of emergency logistics supply chain, the qualification and ability of enterprises should be screened first to ensure that enterprises can avoid the interference caused by objective factors in the process of providing and distributing emergency materials. In addition, it is necessary to evaluate and consider the comprehensive capacity of enterprises involved in emergency logistics supply, screen enterprises whose internal management functions are not clear enough, and improve the level of emergency and contingency capacity of the whole supply chain. At the same time, the government also needs to participate in the enterprise to conduct a comprehensive field survey and analysis, the comprehensive strength is weak, supervision and management in enterprise not only need to require companies to improve their production and supply ability, but also improve the whole team in the process of emergency logistics supply ability of cooperation and assistance with this to ensure the completeness and timeliness of the entire supply chain .

1.2 Optimization of Transshipment and Distribution of Emergency Supplies

The transshipment and distribution of emergency supplies is one of the important parts in the construction of the whole emergency logistics supply chain system. To put it simply, the materials needed by disaster areas or emergency centers need to be produced and transported by suppliers, and then delivered to each demand site in a scientific and reasonable time. Thus it can be seen that in the process of emergency material transportation, large quantities and fewer kinds of materials often appear, and the transportation time is longer. Therefore, in the whole emergency logistics supply chain optimization in the process of building, need to refine the batch of goods, to diversify the transportation of the item, can establish the corresponding regional distribution station, and through the sorting and temporary storage of goods, realize the efficient distribution, and according to the actual situation of distribution and the mode of transportation to adjust in a timely manner, and then to multi-angle optimization of emergency supplies transit and distribution .

1.3 Improvement of Emergency Logistics Reserve Command Center and Information Platform

In the supply chain of emergency logistics, the construction and improvement of emergency reserve command center and information platform is also one of the indispensable central links in the whole supply chain system. As an emergency command center, logistics reserves by itself does not possess the function of the production and transportation, its basic task and goal is based on the information collected by the different channels, in a timely manner to the whole storage and transport aspects of supervision and guidance, and ensure that the entire logistics system can be stable and efficient and orderly running. Therefore, it is necessary to make a good plan for the functions of the logistics reserve command center system, adjust the route of material distribution in time according to the actual situation, and complete the requirements of disaster relief materials. The system construction of information platform is similar to that of reserve command center. However, compared with the task and function of command and dispatch, it has more detailed requirements for the collection and establishment of basic database. It is not only necessary to update and manage the database timely, but also to monitor and dispatch the data warehouse and emergency supplies of the whole logistics organization and command information system with the support of reliable science and technology. Ensure the design of emergency supply chain is reasonable and concise.

2. Optimization Construction of Emergency Logistics Supply Chain under Reliable Technology

2.1 Research on Supply Chain Structure

The main purpose of emergency logistics supply chain is to minimize disaster damage and rescue time in the event of natural disaster or emergency. Therefore, under the support of reliable technology, the construction of emergency logistics supply chain needs to be constantly optimized and improved in line with its own characteristics and capabilities. Generally speaking, the construction of supply chain should conform to the basic principles of short chain and high efficiency, since the network system nodes of each system are independent and related under the support of the network structure system. And establish an emergency center with corresponding rights such as decision-making and command, so as to ensure that in the course of natural disasters or emergencies, the procurement center can command the transportation and allocation of materials at the same time. At the same time, regional emergency reserve centers need to ensure that they are ready to store supplies for transportation and allocation. On the other hand, as the upstream of the whole supply chain, the enterprises producing emergency supplies need to assume the responsibility of emergency supplies. On the basis of the completion of basic work, the distribution stations of materials in the disaster-hit areas should be responsible for the supply and distribution of materials in the downstream disaster-hit areas . Then, through technical support, a complete and systematic supply chain structure can be formed. The specific algorithm is calculated by the fuzzy analytic hierarchy process. The details are as follows: $Y=W^TX$ among: $Y=\{y_1, y_2, \cdots, y_n\}$, Show: $X=\{x_1, x_2, \cdots, x_n\}$,Among them, W is applied.

$$\sum_{i=1}^{n} w_i = 1$$

The formula is obtained:

$$R=\prod_{j=1}^{3}\left[1-\prod_{i=1}^{m}(1-R_i)\right]$$

The following figure shows the structure of the emergency logistics supply chain, as shown in figure 1

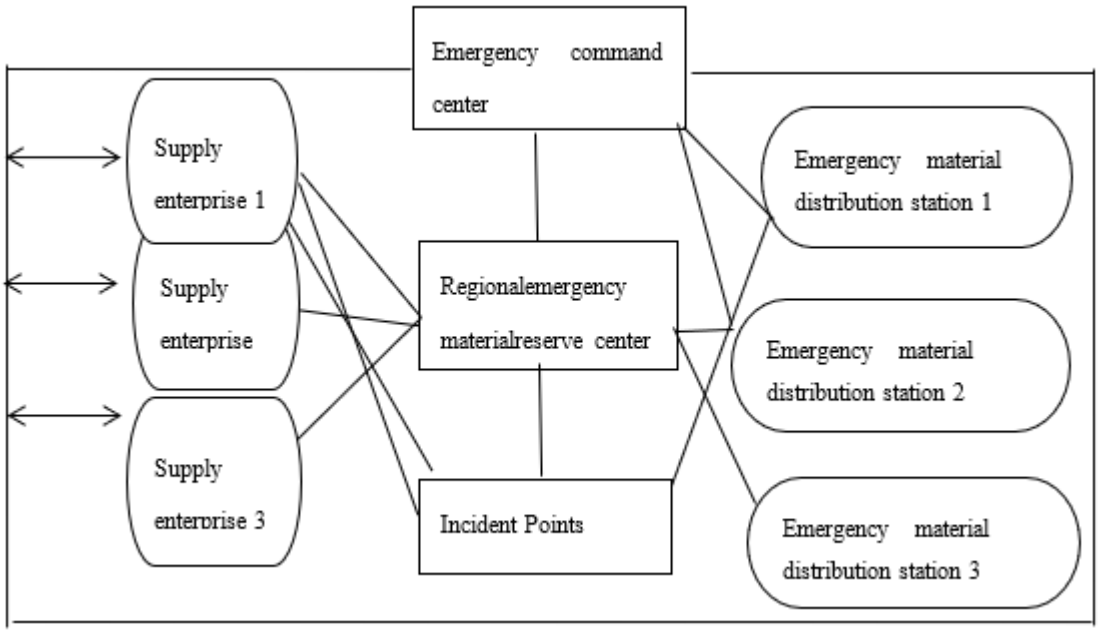

Fig 1. Emergency Logistics supply chain structure

2.2 Reliability Study of Supply Chain System

In the process of the optimization of emergency logistics supply chain system, not only the optimization and perfect construction of the whole supply chain, but also the accurate positioning of its measurement index and reliability. Emergency logistics supply chain system reliability of positioning, generally refers to the incident occurred in the process, conditions and specifications of the emergency logistics can in a limited amount of time, to provide corresponding area has a certain distribution requirements, its system reliability probability of the ability, refers to the reliability of the whole emergency logistics supply chain system.

As an important probability measure parameter that can provide effective evaluation for the emergency logistics supply chain system, it can effectively reflect the level and ability of the system to deal with disasters and emergencies. In the process of system reliability research, the material supplier is the primary factor to ensure the reliability, and its packaging time, packaging quality, packaging quantity and packaging service all affect the reliability. In the process of traditional reliability research, different emergency logistics nodes are important references for reliability originals. To put it simply, the stability of the entire emergency logistics system can be promoted by optimizing the reliability of the relevant stages such as emergency material supply enterprises, reserve centers and distribution stations. At the same time, according to the different characteristics and functions of emergency logistics system business, different subsystems can also be used as analysis nodes in the process of reliability research to determine specific reliability measurement indexes for different management levels, different personnel and equipment specifications in each subsystem. The specific content is shown in the figure below:

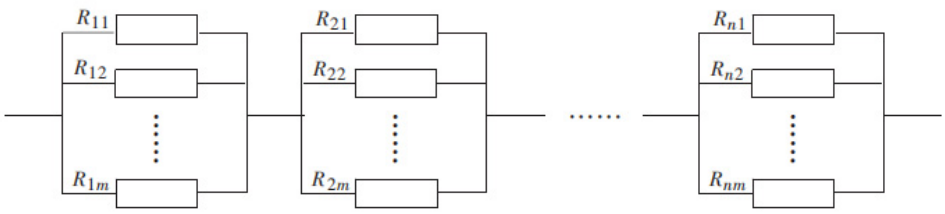

Fig. 2 Reliability diagram of hybrid mesh structure

2.3 Research on Reliability Determination Method of Supply Chain System

It is found that the fuzzy analytic hierarchy process can effectively determine the reliability of different hierarchical nodes in the supply chain system. In general, the measure index will have some fuzziness, so it can be further tested and determined by fuzzy analytic hierarchy process (ahp). On a fault node measure in the process of transportation found that emergency logistics supply chain system is parallel and serial two modes of hybrid network structure, it can be further simplified into a series and three parallel system constitute the system model, and one of the three parallel db for the production and supply, material reserves and distribution system, its different nodes in each subsystem also to improve the reliability of the security of the system. Therefore, it can be seen that in the optimization construction of emergency logistics supply chain based on reliable technology, targeted reliability analysis should be made on the existence mode of different systems and nodes in different systems, so as to fundamentally guarantee the stability and smooth operation of the whole system.

3. Conclusion

With the continuous optimization of the social environment, the ecological environment has suffered different degrees of damage. Therefore, with the continuous improvement of economic environment, natural disasters and emergencies in various regions also occur frequently. In order to improve people's quality of life, it is very important and necessary to optimize the construction of emergency logistics supply chain. This not only requires government writers and social enterprises to constantly play their own value and role, but also needs to be improved and promoted in active and continuous practice, so as to comprehensively improve the emergency response capacity and level of various regions. Achieve all-round development and stability of the people and society.

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