

Risk Management Research of Aviation Dangerous Goods Transportation and Storage

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Keywords: Aviation, Dangerous goods, Transportation and storage, Risk management.

Abstract: With the development of the aviation industry, the safety problems in the air transportation process have gradually entered people's attention, especially the transportation safety of aviation dangerous goods. At present, in the transportation and storage of aviation dangerous goods, there are risks caused by equipment malfunction, personnel violations and management loopholes, and the relevant entities are urgently needed to optimized and improved. Based on this, this paper analyzes the risks of aviation dangerous goods transportation and storage based on the previous literature on aviation dangerous goods transportation, and then points out the corresponding management strategies in order to reduce the probability of aviation dangerous goods transportation safety accidents.

1. Research background

1.1 Literature review

With the continuous improvement of people's awareness of air transport safety, domestic scholars have gradually increased the research on the transportation of aviation dangerous chemicals, and have now formed a documentary that has begun to take shape. Wang Yonggang and Judi identify the hazard sources from the collection, unloading, storage and loading of aviation dangerous goods transportation, and analyze the probability of transportation risk by combining the triangular fuzzy number and ANP (Wang and Zhu, 2012).). Ma Yingpei found through analysis that the current reporting of dangerous goods in air transportation is prominent, the illegal operation is common, and there are management problems in the enterprise. It is necessary to strengthen the supervision and management of dangerous goods transportation (Ma, 2014). Qi Zhengyang and An Hong mainly studied the risk issues in the process of air transport loading and unloading of military dangerous goods. Based on the uncertainty of the influencing factors, the fuzzy set theory was used to establish the air transport handling of military dangerous goods based on fuzzy Bayesian networks. The risk prediction model is guaranteed and the validity and practicability of the model is verified (Jie and An, et al, 2017). Zhang Xing takes Nanjing Lukou Airport Airport Station as the main research object, and studies the risk management of dangerous goods transportation in Nanjing, hoping to ensure the safe production of cargo terminals (Zhang, 2012). Du Fu and He Jiali classify and analyze the violations of dangerous goods air transport in 2012-2016 by dividing the three types of main personnel involved in the dangerous goods air transport chain. Furthermore, the social network analysis method (SNA) is used to construct the relational network model, and the important violations that lead to the chain reaction are obtained, which are "not receiving dangerous goods according to regulations", "not correctly labeled, labeling", "not according to regulations". Dangerous goods are packaged" (Du and He, 2018).

1.2 Purposes of research

In air transportation, any substance that is flammable, corrosive, explosive and radioactive, or that can seriously endanger the safety and health of the person and cause damage to property is called aviation dangerous goods. Since the new century, China's air transport industry has continued to develop, and the scale and number of air transport has gradually increased (Sun et al, 2015). In this context, the safety of air transport has gradually entered the public eye. In the safety of air

transport, the transport of dangerous goods is an important part. Compared with the transportation of goods, the transportation of aviation dangerous goods involves many subjects, the chain is long, and the threat is large, which is difficult to supervise (Chang, 2019). Moreover, with the significant increase in transportation volume, the number of unsafe incidents caused by the transportation of aviation dangerous goods has also increased. Therefore, in the process of transporting dangerous goods in aviation, it is especially necessary to analyze and control the transportation and storage risks to promote the safety of dangerous goods.

2. The main risks faced by aviation dangerous goods transportation and warehousing

2.1 Equipment malfunction

In terms of risk management and control, the importance of hardware and software for aviation dangerous goods transportation and storage equipment is basically the same, and the status is basically the same. In the process of aviation dangerous goods transportation and storage, once these equipments malfunction or abnormal, it will bring great security risks. For example, in a warehouse where aviation dangerous goods are transported, if some of the dangerous goods that need to be frozen are damaged, if the freezer or the refrigeration equipment fails, the dangerous goods will be leaked, resulting in a safety accident, resulting in loss of personnel and finance. For example, in the process of transportation and storage of dangerous goods in aviation, if the transportation equipment is deteriorated or damaged, the transportation of dangerous goods may be bumped or overturned, which may cause property damage, and may cause fire or even explosion.

2.2 Personnel violation

Among the causes of aviation dangerous goods accidents, accidents caused by personnel violations accounted for the largest proportion. Therefore, it can be said that the risk of personnel violation is the most important risk faced by aviation dangerous goods transportation and storage. The risk of personnel violations is mainly manifested in the risks caused by changes in aviation dangerous goods transportation and storage personnel, low quality, insufficient training, and poor work attitude. For example, when the airline's transportation and storage personnel change, the new employee may be missed or mis-inspected due to unskilled work, negligent care, illegal operation, lack of experience, and misjudgment. Security incident. For another example, some air shippers or agents pay too much attention to economic interests, use the gray areas of laws and regulations, report or lie to report dangerous goods as ordinary goods before transportation, thus causing the transportation enterprises to suffer huge reputation, property and credit losses.

2.3 Management vulnerability

In the process of transportation and storage of dangerous goods in aviation, there are many risks arising from management loopholes in aviation enterprises and transportation enterprises. At present, airlines are strict in the management of transportation safety and do not accept the consignment business of individual shippers. Most domestic airlines need to check the consignor of dangerous goods, and the information communication with the aviation enterprises is not smooth, and it is impossible to clearly understand the problems that need to be paid attention to during the transportation of dangerous goods. Therefore, most of the shippers will entrust agents to carry out the transportation of dangerous goods by air. However, at present, China has not yet perfected the supervision system for shipper agents, ground agents and sales agents. In actual operation, airlines still hold the “initiative” of freight forwarding management. This makes it impossible for airlines to punish agents who are not trustworthy and cannot effectively manage agents with problems, which leads to a poor atmosphere in the agency industry, and false reports and false reports have occurred.

3. Management strategy for transportation risk of aviation dangerous goods transportation

3.1 Improve the rules and regulations of air transport warehousing and improve the management level of enterprises

Rules and regulations are the cornerstone of high-efficiency and standardized operation of enterprises, and are the basis for management of the leadership. It is known that operators complete specific tasks. Therefore, for the control of aviation dangerous goods transportation and storage risks, it is necessary to first introduce corresponding management measures at the macro level. In other words, Chinese air transport enterprises should improve the rules and regulations related to transportation and warehousing, and continuously improve the management level of their dangerous goods transportation. Specifically, air transport companies should improve the procedures for the storage of dangerous goods, and further refine the current “operational methods” and standards to regulate the behavior of operators. At the same time, aviation companies should also introduce management measures for the cloud beast link, strictly regulate the rights and obligations of the shipper, clarify the agency duties, and impose restrictions on the shipper's legal accountability to prevent market environmental risks. In addition, aviation companies need to formulate internal dangerous goods regulations, operating manuals and operation instructions; conduct regular assessments of relevant dangerous goods storage monitoring and inspection personnel, and ask them to propose rectification, thereby further improving the company's aviation risks. The management level of goods transportation and storage reduces security risks.

3.2 Strengthen management training for employees and improve the quality of transport warehousing practitioners

In addition to establishing air transport warehousing rules and regulations, aviation companies should also strengthen management training for dangerous goods transport warehousing personnel, and improve the quality of practitioners to effectively reduce the risk of violations of dangerous goods transport personnel. On the one hand, airlines should conduct various trainings for relevant practitioners, including dangerous goods transportation and storage laws and regulations, basic knowledge of storage, and dangerous goods categories. At the same time, different types of special training and re-training should be carried out for practitioners with different job responsibilities, such as dangerous goods collection and transportation personnel, general cargo operators, transportation and unloading personnel, management personnel, and ombudsmen. After the training, the employees will be assessed, and the qualified practitioners can be employed. On the other hand, the risk of transportation of dangerous goods in aviation is high, so it is necessary for airlines to set up an emergency rescue team for dangerous goods transportation accidents. The team must be on duty 24 hours a day to ensure that they arrive in the first time after a security incident. At the same time, aviation companies need to cooperate with firefighting, public security, medical care, health and other rescue departments to jointly establish a joint rescue mechanism to deal with dangerous goods transportation accidents and minimize the harm caused by safety accidents.

3.3 Applying advanced Internet technology to realize air transportation warehousing supervision and tracking

It is difficult to achieve complete supervision of risks by means of rules and regulations and man-made management. Therefore, it is necessary to use technology to predict and prevent the risk of aviation dangerous goods transportation. In short, aviation companies need to apply advanced Internet technology to achieve warehousing supervision and dangerous goods transportation tracking of aviation dangerous goods. For example, airlines can use RFID radio frequency identification technology to track the entire process of dangerous goods from storage to storage or transportation, so as to timely discover the abnormal conditions encountered during the transportation of dangerous goods and reduce potential safety hazards. At the same time, airlines can also apply modern positioning technologies such as satellite positioning technology (GPS) and geographic information system (GIS) to supervise and track the whole process of dangerous goods

transportation and storage. Effectively prevent and control the safety risks of dangerous goods transportation through technical means.

3.4 Establish an air traffic risk prevention and control system and rationally arrange dangerous goods storage areas

Many aviation dangerous goods transportation and storage risks are caused by the natural environment, that is, the layout of the storage area is unreasonable. Therefore, the national government and aviation enterprises need to cooperate with each other to jointly establish an air traffic risk prevention and control system and rationally arrange dangerous goods storage areas. Specifically, the establishment of the prevention and control system can be carried out in terms of the promulgation of laws and regulations, the inspection of competent authorities, and the formulation of operational rules to ensure that every link of the dangerous goods transportation process is safe and efficient. In terms of the storage area and environment selection of dangerous goods operations, airlines should strictly abide by the “Technical Conditions for the Storage and Maintenance of Flammable and Explosive Commodities” and CCAR-276-R1. Experts can be hired to plan and design the workplace and warehouse, and rationally arrange the storage areas of dangerous goods of all levels and types, thereby reducing the risk of dangerous goods in the storage process due to mutual reaction.

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