Received: 16 Jul. 2023 | Revised: 28 Jul. 2023 | Accepted: 14 Aug. 2023 | Published online: 29 Aug. 2023
RESEARCH ARTICLE

Journal of Global Humanities and Social Sciences
2023,Vol. 4(4)166-170
DOI : 10.61360/BoniGHSS232014130803

Research on Safety Management of Equipment Logistics from the Perspective of Military-Civilian Integration

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Abstract: With the rapid development of science and technology and the economy, civil-military integration has become the new trend and main direction of global development. In the era of civil-military integration, the importance of equipment logistics safety management has become increasingly prominent, which not only concerns national security and military strength but also directly affects economic development and social stability. Therefore, it is important to study and discuss the safety management of equipment logistics from the perspective of civil-military integration to improve the safety, efficiency, and reliability of equipment logistics. The article focuses on the safety management strategy of equipment logistics from the perspective of civil-military integration, to provide some useful reference and reference for relevant research and practice.

Keywords: civil-military integration; equipment logistics; safety management; information sharing

Introduction

With the rapid development of military science and technology and the continuous promotion of the market economy, the exchanges and cooperation between the military and civilian fields have become more and more frequent, and civil-military integration has become an important strategic direction of national development. In the process of civil-military integration, equipment logistics safety management becomes an issue that cannot be ignored. Equipment logistics safety management aims to guarantee the safety and reliability of equipment and materials in the process of production, transportation, storage, and distribution through the comprehensive use of advanced technical means and management modes. However, in the current complex and changing civil-military integration environment, equipment logistics management is faced with a series of challenges such as information security, supply chain management, and collaborative operations, and it is urgent to develop effective management strategies and measures to ensure the safety and efficiency of equipment logistics. Therefore, it is of great theoretical and practical significance to conduct in-depth research and exploration of the safety management of equipment logistics from the perspective of civil-military integration.

1. Overview of civil-military integration

Civil-military integration refers to the deep integration and cooperation between military and civilian fields, which is an important initiative at the national strategic level and aims to promote the organic connection between national defense construction and economic and social development through the integration and sharing of military and civilian resources. First, civil-military integration requires close cooperation between the military and the civilian sector in science and technology innovation, personnel training, and technology transfer to jointly promote technological progress and innovation capability; second, civil-military integration requires the military to participate in the

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civilian industry, actively promote the transformation and application of military technology to the civilian sector, and promote the development and transformation and upgrading of the military industry (Lai, 2023); in addition, civil-military In addition, military-civilian integration also emphasizes the sharing and integration of military and civilian resources, and realizes the interoperability between the military and civilian fields in terms of materials, facilities, and personnel. Through civil-military integration, the military can acquire advanced technology, market demand, and management experience in the civilian sector, while the civilian sector can take advantage of the military's scientific research strength, resource advantages, and safety guarantee capabilities. Civil-military integration provides a new path for the country to promote economic development and national defense modernization and achieve the goal of a win-win situation for both the military and the civilians.

2. The equipment logistics safety management overview

2.1 The connotation of equipment logistics safety management

Equipment logistics safety management is a series of management measures and risk control methods taken to ensure the safety, reliability, efficiency, and stability of equipment in equipment logistics activities, which include procurement, storage, transportation, maintenance, and decommissioning of equipment (Zhang, & Jia, 2020), and involves the coordinated management of many participants and resources. As an important part of national security and military power, the security of its logistics activities is crucial, including preventing security risks such as loss and theft of materials, protecting the integrity and confidentiality of equipment, and preventing potential malicious damage and attacks; reliability means that equipment logistics activities can provide the required materials and services on time and demand, and ensure the normal operation and maintenance of equipment; efficiency means that in meeting Under the premise of security and reliability, optimize the supply chain and logistics process, reduce the material and information detention and waste, improve the speed and flexibility of equipment logistics, reduce costs and resource consumption.

2.2The importance of equipment logistics safety management

Equipment logistics involves the army's key equipment and materials, and its security is closely related to national security and military strength. Effective equipment logistics security management can prevent equipment and materials from being stolen, destroyed, or misused, and ensure the army's combat power and combat capability. The accuracy and reliability of equipment logistics are crucial to the army's operations. In military operations, a timely and accurate supply of equipment and materials is the basis for maintaining the army's combat capability and sustained combat effectiveness, and equipment logistics safety management can ensure that equipment and materials reach their destinations on time and improve the effectiveness of military operations. Equipment logistics security management not only involves military equipment, but also includes a series of sensitive information and technologies related to military equipment (Zhang, et al., 2020), the leakage, theft or illegal use of these information and technologies will hurt social stability, and by strengthening the security management of equipment logistics, it can effectively prevent these information from being misused or used for illegal activities and maintain social stability and harmony. Equipment logistics safety management is an important support for the development of civil-military integration. Under the background of civil-military integration, the exchange and cooperation between military and civilian fields are increasing, and the flow of equipment and materials is becoming more and more frequent, through the establishment of a sound equipment logistics safety management system, can promote the in-depth development of civil-military integration and achieve the goal of resource sharing and mutual benefit.

3. The equipment logistics safety management strategy under the perspective of civil-military integration

3.1Establish a comprehensive safety management system

Based on a comprehensive risk assessment, including the assessment of each link and a key node in the process of equipment logistics, the possible security risks and threats can be determined, and then the corresponding security management strategy can be formulated in a targeted manner to ensure that the most effective preventive and precautionary measures are taken in each link. Establish a clear security policy, including provisions for the overall objectives and principles of equipment logistics security, as well as the responsibilities and obligations of each participating party in security management, and the policy should clarify the standards and requirements for security management and provide guidance for subsequent procedures and specifications (Zhang, et al., 2019). Establish corresponding safety procedures and operational specifications that cover all aspects of equipment logistics and clarify the safety control requirements for each link to ensure that each operation meets safety standards. For example, in the starting place, safety operation procedures for equipment loading and packaging can be developed; in the transit place, safety procedures for equipment transfer and storage can be developed; at the destination, safety operation specifications for equipment unloading and acceptance can be developed. Establish supervision and evaluation mechanisms to regularly check the effectiveness and compliance of the safety management system, which can be done through safety inspections, internal audits, and third-party evaluations to assess the implementation of the safety management system, identify problems and make corrections promptly.

3.2Strengthen personnel review and training

Personnel review is an important measure to ensure that the staff involved in equipment logistics have a good reputation and suitable background. When conducting a personnel review, personal qualifications, and credibility verification can be conducted, including educational background, professional experience, honorary awards, etc., especially for personnel with logistics management and safety experience, special attention should be paid to their past work experience and performance. Safety training should be carried out, and the content of the training should be designed by the duties and work characteristics of the staff, including logistics safety awareness, emergency response, hazardous materials handling, etc., to improve the safety awareness and response-ability of the staff in the process of equipment logistics (Su, et al., 2023)., and the training can be carried out in the form of classroom education, field training, and simulation exercises. The safety requirements and technical standards in the field of equipment logistics are constantly evolving, therefore, the training program also needs to be constantly updated and strengthened, and the evaluation and improvement mechanism of the training program can be established to regularly assess the effectiveness and satisfaction of the training program and make corresponding improvements and optimization according to the evaluation results.

3.3 Application of information technology

A real-time positioning system (RTLS) is an advanced technology means that can be used to track and monitor the location and status of equipment in real time, and by installing positioning equipment on the equipment, the location data of the equipment can be transmitted to the central monitoring system in real-time, to achieve real-time monitoring and tracking of the equipment (Shang, et al., 2023) and prevent the equipment from being stolen or lost. Drones can deliver equipment quickly and flexibly to reduce the risk to personnel and equipment, and they can also be used to inspect equipment storage and transportation area safety, discover potential safety hazards, and take corresponding measures on time. Artificial intelligence (AI) technology can be applied to the safety management of equipment logistics. Through AI technology, data from the equipment logistics process can be analyzed and predicted to identify abnormal situations on time, for example, through machine learning algorithms, the behavior patterns of equipment can be modeled to discover potential risks and threats. In addition, AI technology

can be used for intelligent analysis of video surveillance systems to quickly identify abnormal behavior and dangerous situations. Internet of Things (IoT) technology can realize real-time interconnection of equipment logistics information. By installing sensors on equipment, monitoring, and collection of data such as equipment status, temperature, and humidity can be realized, which helps to grasp the transportation status of equipment in time.

3.4 improve logistics network security protection

A network firewall is the first line of defense for logistics network security, which can stop unauthorized access and network attacks, and by configuring firewall rules, the entrance and exit of the logistics network can be restricted to prevent unauthorized data transmission and access (Wang, & Jiang, 2020). Using Intrusion Detection System (IDS) and Intrusion Prevention System (IPS), IDS and IPS can monitor the traffic and data of the logistics network in real-time to identify and stop intrusions promptly, IDS can detect abnormal activities and attacks in the network and generate alerts to respond accordingly; IPS can actively stop intrusions and block suspicious traffic, thus protecting the logistics network security. Strengthen the authentication and access control of the logistics network by implementing a strict authentication mechanism to ensure that only legitimate users and devices can access the logistics network; using measures such as multi-factor authentication, single sign-on, and access control lists can limit user rights and access scope to reduce the risk of unauthorized access and information leakage. Encrypting data transmission and storage in logistics network, adopting encryption technology to encrypt data in logistics network can ensure the confidentiality and integrity of data during transmission and storage; by adopting SSL/TLS protocol for encrypted communication and using an encryption algorithm to encrypt data, data can be effectively prevented from being tampered and stolen. Through regular security assessment and vulnerability scanning, security weaknesses and vulnerabilities in the logistics network can be identified and timely measures can be taken to repair and improve them. The security assessment can be conducted by external security agencies or by internal security teams for self-inspection and testing to ensure the security and reliability of the logistics network. Establish a detailed log recording and auditing mechanism to comprehensively record the operations and events of the logistics network, including user login and operation records, network traffic and communication records, etc. Through log recording and auditing, potential security problems and events can be traced and analyzed to provide an important basis for security management and investigation.

3.5 Establish an emergency response mechanism

Establish a specialized emergency response team, consisting of personnel with relevant professional knowledge and experience; team members should include logistics managers, security experts, technical personnel, etc.; clarify the responsibilities and tasks of each member; and establish an effective communication and collaboration mechanism. Develop a detailed emergency response plan, including the classification and level of various security incidents, emergency procedures, division of responsibilities, contact information, etc. The emergency response plan should be adjusted and updated according to different situations and needs to ensure its real-time nature and effectiveness. Establish a reliable emergency communication system, including telephone hotlines, emails, instant messengers, etc., to facilitate timely communication and coordination of emergency response, and at the same time, ensure that the emergency communication system has a backup plan and emergency contact information in case of failure or network disruption. Organize regular emergency drills and training to familiarize emergency response team members with emergency response plans and processes and to acquire the corresponding skills and knowledge; drills and training can be conducted by simulating security events, organizing escape drills, and holding training courses to improve the emergency response capabilities of team members (Tao, 2021). Establish a real-time monitoring and early warning system to monitor the operational status and security of the logistics system in real-time using sensors, surveillance cameras, and alarm devices, and once

abnormalities or security threats are detected, the early warning system is immediately triggered and the emergency response team is notified to handle the situation accordingly. Establish information sharing and cooperation mechanisms with relevant departments, partners, and security agencies to share relevant security intelligence and information to understand and respond to potential threats promptly, and at the same time, develop emergency response plans and establish cooperative relationships with other relevant parties to improve the efficiency and capability of emergency response.

Conclusion

In the era of civil-military integration, equipment logistics security management is an important link to ensure national security and economic development. By establishing a comprehensive safety management system, strengthening personnel review and training, applying information technology, improving logistics network safety protection, and establishing emergency response mechanisms and other strategies, we can effectively strengthen the safety of equipment logistics, improve the level of equipment logistics safety management, and provide strong support for the development of civil-military integration. In future research, it is necessary to further explore new theories and methods to promote the innovation and development of equipment logistics safety management to adapt to the changing environment and needs of civil-military integration and to promote the smooth progress of civil-military integration.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

Acknowledgement

This research was funded by:

This work was supported by social science fund subject of Zhanjiang philosophy of 2022,. ZJ22YB08.

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How to Cite: Yin, H.,Chen, J.,Wei, L.,& Pu, Z. Research on Brand Image Marketing Strategy - From Brand Awareness to Brand Loyalty. *Journal of Global Humanities and Social Sciences*, 04(04), 166-170.
https://doi.org/ 10.61360/BoniGHSS232014130803