ORGANIZATION OF CARGO TRANSPORTATION OF ECONOMIC SECTORS

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Annotation: This paper examines the theoretical and practical aspects of organizing freight transportation in various sectors of the economy, including industrial cargo. The study analyzes the processes of preparing goods for transportation, including the characteristics of wooden, metal, and vacuum packaging and their role in ensuring cargo safety. Issues related to proper loading and securing of cargo on transport vehicles, as well as monitoring and management of transportation processes using GPS tracking systems, are also discussed. Special attention is given to warehouse operations, cargo storage and handling processes, transport safety measures, and the specific characteristics of dangerous goods. In addition, the importance of insurance documents and the procedures for their preparation in freight transportation are highlighted. The research findings contribute to improving transportation efficiency, enhancing safety, and optimizing logistics processes.

Keywords: industrial cargo, preparation of cargo for transportation, wooden packaging, metal packaging, vacuum packaging, cargo securing, GPS monitoring and control, warehouse operations, safety measures, characteristics of dangerous goods, insurance documents

INTRODUCTION

The operations of preparing cargo for transportation are usually carried out by shippers. Transport organizations must receive cargo at the destination, deliver it to the designated address on time and hand it over to the consignee without compromising the quality and quantity indicators established by the current rules and standards, that is,

without compromising the cargo. At the same time, many goods, products and raw materials are not ready for transportation immediately after production. For example, it is not always possible to place large and heavy cargoes on vehicles in accordance with the load-bearing dimensions. In such cases, the cargo is divided into parts and brought into a condition suitable for transportation. These processes must be carried out in advance by the shipper. It is also necessary to place products such as flour and sugar in special bags.

Thus, the operations of preparing cargo for transportation are carried out by cargo owners and are an important stage of the transport process. Industrial cargo includes raw materials, materials, semi-finished products, equipment and technical equipment, components, fuel, energy carriers and production waste in the production process. These cargoes constitute a complex related to the transportation and storage of all material resources necessary for the production activities of the enterprise. They play an important role in ensuring the continuity of the production process, in logistics systems and in cooperative relations between enterprises**.**

REVIEW OF THE LITERATURE ON THE TOPIC

The role of the freight transportation system in transport in increasing economic potential has been widely studied as one of the current scientific directions in recent years. Research in this area is mainly focused on the impact of the development of transport infrastructure on the economy, the introduction of modern logistics technologies, and integration into international trade chains.

M. Porter in his work “Competitive Advantage” substantiated the important role of the transport system in ensuring competitiveness. He interpreted the transport and logistics system as an integral part of the economic value chain and emphasized its role in the efficient allocation of resources.

J. Rodrigue in his study “The Geography of Transport Systems” analyzed the macroeconomic impact of the transport system on economic potential. He scientifically substantiates that the development of transport infrastructure serves to increase trade and reduce logistics costs. He also notes that the expansion of regional transport routes has a positive impact on increasing the efficiency of international trade. E. Ballou, studying the

issues of strategic planning of transport and logistics, emphasizes that the technological development of logistics infrastructure brings added value to the economy. In his opinion, the introduction of modern technologies, including automated logistics systems, increases the speed of cargo delivery and increases overall efficiency. In studies on the development of the transport and logistics system in the economy of Uzbekistan, in particular, A. Toshmatov analyzed the current state and future development directions of the national logistics infrastructure. He argues that the programs for the establishment of logistics centers implemented by the state are an important factor in increasing export potential. In general, the transport and logistics system plays an important role in increasing economic potential. Scientific research conducted in this area serves to identify priority areas for further improvement of the system**.**

RESEARCH METHODOLOGY

This study studied the processes of organizing freight transportation in economic sectors based on an integrated approach. The research used analytical, comparative and systematic approaches. The main stages of the freight transportation process, including packaging, loading, transportation and delivery operations, were studied and the factors affecting their efficiency were identified. Practical information on logistics systems, GPS monitoring, warehouse management and security measures was also analyzed. The study used generalization and conclusion methods based on existing scientific literature, modern transport and logistics systems and practical experience.

ANALYSIS AND RESULTS

When carrying out loading and unloading, warehouse operations and delivery processes, special attention is paid to protecting cargo from damage, delivering it within the specified time limits, as well as minimizing the environmental impact of transport. The responsibility of transport employees in these processes is of great importance

Wooden packaging is one of the most common methods. Boxes come in different sizes: small (up to 0.5 m^3), medium (0.5–1.5 m^3) and large (more than 1.5 m^3). They are mainly made of wood or plywood. For heavy loads, metal corners and reinforcing tapes

are additionally used. The inside of the boxes is filled with soft materials such as foam rubber, corrugated cardboard or plastic film.

Metal packaging consists of barrels, boxes and containers. A standard metal barrel usually has a capacity of 200 liters and is used to transport liquid and pasty substances. Metal boxes have hermetic properties and are widely used to transport chemicals and valuable cargo. IBC containers (Intermediate Bulk Container) are cube-shaped containers with a capacity of 1000 liters and consist of a plastic reservoir placed inside a metal frame.

Vacuum packaging is carried out by removing the air around the product. This method is used for food products, electronics and medical equipment. Shrink film is also an effective tool for combining several loads into a single unit, and stretch film is an effective tool for wrapping loads on pallets. Cargo securing is carried out in vehicles (cars, trucks, trains, ships or airplanes) to ensure that the cargo does not shift, overturn or become damaged during movement. Steel chains are usually manufactured in diameters from 6 mm to 16 mm and can hold loads from 1 to 10 tons. They are equipped with special locking and tensioning mechanisms. Each chain has a maximum load rating specified by the manufacturer. Chains are regularly inspected and damaged parts are replaced in a timely manner. Textile straps (straps) are effective for securing cargo with slippery surfaces due to their elastic and soft structure. They are made of polyester or nylon and are distinguished by color according to their load-bearing capacity: yellow - 1 ton, blue - 2 tons, red - 5 tons. The ratchet mechanism allows for easy tightening and loosening of the straps. Corner protectors are used to soften the sharp edges of the cargo and prevent damage to the fastening tools. Wooden barriers or beams are installed under or on the sides of the cargo, limiting its movement and ensuring even weight distribution. Pneumatic cushions (airbags) are used to ensure the immobility of cargo inside the container, and are placed in gaps and filled with air. A number of factors are taken into account when choosing a route. The quality of the road surface is important, with asphalt roads being suitable for all types of transport, while dirt roads are suitable mainly for use in the dry season and with special vehicles. Road width is also an important factor, with two-lane roads having an advantage in terms of safety and speed, while narrow roads in mountainous areas require caution.

Bridges and overpasses have load-bearing restrictions, with the maximum permissible load usually set at 40–60 tons. For loads exceeding this figure, special permits and alternative routes are required. There are height restrictions in tunnels and underground roads, usually 4.2–4.5 m, and in some cases 3.8 m. Preliminary road reconnaissance is carried out for oversized loads. Special routes are set for the transportation of dangerous goods. These routes are carried out in areas far from residential areas, public facilities (schools, hospitals), water sources and environmental protection zones. In some cities, access to central areas with dangerous goods is restricted or allowed only during certain time periods (00:00–06:00). During the time planning process, drivers' working hours are regulated based on international standards. Daily driving time should not exceed 9 hours (up to 10 hours are allowed twice a week). After every 4.5 hours of driving, a break of at least 45 minutes is mandatory. Daily rest time is at least 11 hours (in some cases it can be reduced to 9 hours, with subsequent compensation). The tachograph (digital control device) constantly records the driver's activities: driving time, breaks, rest periods and loading processes. This information is stored on special cards and checked by supervisory authorities. Compliance with cargo delivery deadlines is important. Violation of the established deadlines can lead to financial obligations. For perishable goods, in particular, food products, it is necessary to strictly adhere to the time and temperature regime, which is an important factor in maintaining their quality. GPS monitoring systems are an integral part of the modern cargo transportation process. Trucks are equipped with GPS/GLONASS trackers, which transmit the location of the vehicle at intervals of 10–30 seconds. Dispatchers monitor the movement of all vehicles in real time via a computer and make the necessary management decisions. These systems allow for route monitoring, speed control, fuel consumption calculation, parking places and times, as well as geo-zones (permitted and restricted areas).

Telemetric systems monitor engine status, including engine speed, fuel consumption, coolant temperature, and brake pressure. This information helps to identify problems early and optimize maintenance costs. Some systems also evaluate the driver's driving style, such as sudden braking, acceleration, and compliance with speed limits. Video monitoring

(dashcam and interior cameras) is an important tool for analyzing situations that occur during transportation and increasing safety. To ensure information security, all information is transmitted via encrypted channels. The organization of warehouse operations consists of several stages. First, the packaging condition of the cargo is visually inspected, then its quantity is determined by measuring and weighing. If necessary, laboratory analyzes are carried out for quality control. All data is entered into information systems and the cargo is recorded in the warehouse. Storage areas are organized by type of cargo: open areas for ordinary cargo, closed warehouses for valuable cargo, and special freezers for refrigerated products.

ABC analysis is used when placing cargo: fast-moving cargo of category A is placed close to the entrance, and slow-moving cargo of category C is placed in more remote areas.

WMS (Warehouse Management System) is a modern warehouse management system that allows you to track each cargo unit, determine the optimal storage location, and plan operations. Barcode scanning technology reduces errors, and automated systems (robots and conveyors) increase the efficiency of processes.

Special attention is paid to safety measures during cargo transportation. Properly placed and secured cargo ensures the safety of the transport process and creates a stable environment for all participants.

The use of personal protective equipment is mandatory, including a hard hat, safety glasses, gloves and special shoes. Additional protective equipment is also used if necessary.

Compliance with safety regulations is an important requirement of the transport process. It is necessary that working areas are clearly marked, lifting processes are carried out under control and continuous control is ensured through communication means. In order to prepare for emergency situations, warehouses and terminals are equipped with fire extinguishing equipment, first aid stations and evacuation plans.

Documentation plays an important role in cargo transportation. The CMR (international consignment note) is the main document of the transport process, which reflects information about the sender and recipient, cargo description, transportation

conditions and payment issues. The TTN is an internal settlement document, which contains cargo value and tax information. Additional documents are required for dangerous goods. The MSDS (Material Safety Data Sheet) describes the safety properties of the substance, and the ADR certificate confirms that the driver has undergone special training. The route card contains information on the transportation route, stops and necessary services. Customs clearance is mandatory for international transportation. Export and import declarations, invoices, packing lists and certificates ensure the legal movement of goods. Through the TIR carnet system, goods can be transported through the territories of several countries in a simplified manner, which saves time and costs. The insurance system is an important protection mechanism in the transportation process. Cargo insurance serves to guarantee the safety of the cargo and covers various risks. While the “All Risks” type of insurance provides comprehensive protection, “Named Perils” covers only the specified risks. The carrier's liability insurance system is also important in ensuring the stability of the transport process.

CONCLUSION AND SUGGESTIONS

Organizing cargo transportation of economic sectors is one of the important and priority tasks of the transport system. The effective functioning of each economic sector directly depends on the timely, safe and economically efficient delivery of cargo. Therefore, careful planning of the cargo transportation process, the correct selection of transportation methods, the effective use of transport vehicles, and the systematic organization of logistics processes are of particular importance.

In the process of organizing cargo transportation, factors such as the type, volume, transportation distance, transportation conditions, and economic efficiency are comprehensively taken into account. The characteristics of cargo differ in different economic sectors. For example, in the industrial sector, raw materials and finished products are mainly transported, while in agriculture, perishable products or bulk cargo prevail. Therefore, it is necessary to select the appropriate vehicle and modern transportation technologies for each type of cargo.

In addition, the effective organization of the logistics system in the cargo transportation process, optimization of transport routes, mechanization of loading and unloading operations, and the introduction of advanced information technologies will provide significant results. These measures will serve to reduce transport costs, rational use of time resources, and strengthen the interconnection between economic sectors.

Based on the above, it is appropriate to put forward the following proposals:

• widespread introduction of digital logistics systems in cargo transportation processes;

• modernization of transport infrastructure and development of multimodal transportation systems;

• increasing the level of automation and mechanization of cargo loading and unloading processes;

• further strengthening safety standards and environmental requirements;

• improving the system of training qualified personnel in the logistics sector.

In general, improving the process of organizing cargo transportation on a scientific basis is an important factor in ensuring the sustainable development of the economy.

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