MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

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« 03 » June 2024

QUALIFICATION PAPER

(EXPLANATORY NOTES)

OF GRADUATE OF ACADEMIC DEGREE

«BACHELOR»

THEME: **«Organization of the security management system of enterprises in the aviation industry»**

Speciality 073 «Management»

Educational and Professional Program «Aviation logistics»

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I certify that in this qualification paper there are no borrowings from the works of other authors without appropriate references Anastasiia YEFIMENKO
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Kyiv 2024

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АВІАЦІЙНИЙ УНІВЕРСИТЕТ
Факультет транспорту, менеджменту і логістики
Кафедра логістики

ЗАТВЕРДЖУЮ
В.о. завідувача кафедри логістики
Світлана СМЕРІЧЕВСЬКА
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«03» червня 2024 р.

КВАЛІФІКАЦІЙНА РОБОТА

(ПОЯСНЮВАЛЬНА ЗАПИСКА)

ЗДОБУВАЧА ОСВІТНЬОГО СТУПЕНЯ

«БАКАЛАВР»

ТЕМА: **«Організація системи управління безпекою підприємств авіаційної галузі»**

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Засвідчую, що у цій кваліфікаційній роботі немає запозичень з праць інших авторів без відповідних посилань Анастасія ЄФІМЕНКО
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Київ 2024

NATIONAL AVIATION UNIVERSITY
Faculty of Transport, Management and Logistics
Logistics Department

Academic Degree Bachelor

Speciality 073 «Management»

Educational and Professional Program «Aviation logistics»

APPROVED
Acting Head of the Department
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« 13 » May 2024

TASK

FOR COMPLETION THE QUALIFICATION PAPER OF GRADUATE GRADUATE

Anastasiia Yefimenko
(surname and name)

1. Theme of the qualification paper: «Organization of the security management system of enterprises in the aviation industry» was approved by the Rector Directive № № 624/ст. of April 24, 2024.
2. Term performance of paper: from 01.05.2024 to 31.05.2024 .
3. Date of submission paper to graduation department: general and statistical information of the company «Cargo Logistic Service Ukraine», economic and financial indicators of the company's activity, literary sources on organization of the security management system in aviation industry enterprise.
4. Content of the explanatory notes: required to study the theoretical basis of the organization of the enterprise security management system; analyze the financial and economic performance of the company «Cargo Logistic Service Ukraine»; develop recommendations for improving the security service at the enterprise «Cargo Logistic Service Ukraine» and calculate of the economic efficiency of the project.
5. List of obligatory graphic matters: tables, charts, graphs, diagrams illustrating the current state of problems and methods of their solution.

6. Calendar schedule:

№	Assignment	Deadline for completion	Mark on completion
1	2	3	4
1.	Study and analysis of scientific articles, literary sources, normative legal documents, preparation of the first version of the introduction and the theoretical chapter	13.05.24-16.05.24	Done
2.	Collection of statistical data, timing, detection of weaknesses, preparation of the first version of the analytical chapter	17.05.24-20.05.24	Done
3.	Development of project proposals and their organizational and economic substantiation, preparation of the first version of the project chapter and conclusions	21.05.24-26.05.24	Done
4.	Editing the first versions and preparing the final version of the qualification work, checking by standards inspector	27.05.24-29.05.24	Done
5.	Approval for a work with supervisor, getting of the report of the supervisor, getting internal and external reviews, transcript of academic record	30.05.24-02.06.24	Done
6.	Submission paper to Logistics Department	03.06.24	Done

Graduate_____
(signature)

Supervisor of the qualification work_____
(signature)

7. Consultants of difference chapters of paper:

Chapter	Consultant (position, surname and name)	Date, signature	
		The task was given	The task was accepted
Chapter 1	Professor, Bugayko D.O.	10.05.24	10.05.24
Chapter 2	Professor, Bugayko D.O.	13.05.24	13.05.24
Chapter 3	Professor, Bugayko D.O.	24.05.24	24.05.24

8. Given date of the task May 13, 2024.

Supervisor of the qualification paper:_____ Dmytro BUGAYKO
(signature of supervisor) (surname and name)

Task accepted for completion: _____ Anastasiia YEFIMENKO
(signature of graduate) (surname and name)

РЕФЕРАТ

Загальний обсяг пояснювальної записки до кваліфікаційної роботи «Організація системи управління безпекою підприємств авіаційної галузі» становить 97 сторінок та містить 30 рисунки, 19 таблиць, 53 використаних джерел.

АВІАЦІЙНА БЕЗПЕКА, АВІАЦІЙНЕ ПІДПРИЄМСТВО, ТЕХНОЛОГІЯ, СИСТЕМА УПРАВЛІННЯ БЕЗПЕКОЮ, ЗАХИСТ, ЕФЕКТИВНІСТЬ

Актуальність теми кваліфікаційної роботи обумовлена необхідністю розробки ефективних стратегій запобігання небажаним та небезпечним діям, які можуть загрожувати безпеці авіаційних підприємств. Крім того, підкреслюється важливість створення надійних механізмів реагування на надзвичайні ситуації, в тому числі авіаційні інциденти, катастрофи та інші надзвичайні події.

У теоретичній частині роботи досліджено науково-практичні положення оцінки, методів та стратегій в організації управління авіаційною безпекою.

Аналітична частина роботи присвячена аналізу виробничо-фінансової діяльності ТОВ «Карго Логістик Сервіс Україна» та оцінці стану авіаційної безпеки.

У проектній частині автором досліджено особливості комплексної системи організації авіаційної безпеки на підприємстві, а також розроблено проектні пропозиції щодо впровадження відділу охорони та безпеки для забезпечення авіаційної безпеки на ТОВ «Карго Логістик Сервіс Україна».

Матеріали кваліфікаційної роботи рекомендуються для використання під час проведення наукових досліджень, у навчальному процесі та в практичній роботі фахівців логістичних підрозділів.

ABSTRACT

The explanatory notes to the qualification paper «Organization of the security management system of enterprises in the aviation industry» comprises of 97 pages, 30 figures, 19 tables, 53 references.

SECURITY, AVIATION ENTERPRISE, SAFETY MANAGEMENT SYSTEM, AVIATION SUPPLY CHAIN, PROTECTION, EFFICIENCY

The relevance of the qualification paper is based on the need to develop effective strategies to prevent illegal actions that may threaten the security of aviation enterprises. In addition, it emphasizes the importance of establishing reliable mechanisms for responding to emergencies, including aviation incidents, disasters and other emergencies.

In the theoretical part of the work, the scientific and practical provisions of assessment, methods and strategies in the organization of aviation safety management are investigated.

The analytical part of the work is devoted to analyzing the production and financial activities of «Cargo Logistic Service Ukraine» LLC and assessing the state of aviation security.

In the project part, the author investigated the features of an integrated system of aviation security organization at the enterprise, as well as developed project proposals for the implementation of a safety and security department to ensure aviation safety at «Cargo Logistic Service Ukraine».

Materials of the qualification paper are recommended for use during scientific research, in the educational process and in the practical work of specialists of logistics departments.

CONTENTS

NOTATION

ICAO – Civil Aviation Organization

IATA – International Air Transport Association

ECAA – European Civil Aviation Conference

EUROCONTROL – European Agency for the Safety of Air Navigation

SMS – Safety Management System

NCASP – National Civil Aviation Security Programme

SARPS – Standards and Recommended Practices

INTRODUCTION

The transportation system is a critical component of modern society, as it integrates various modes of transportation to meet the needs of the people, businesses and the economy as a whole at the national and international levels. Air transport, which plays a key role in this system, is not only a means of transportation, but also a set of infrastructure facilities that ensure the smooth operation of the air fleet through a network of airports, ground handling facilities and logistics centers. They facilitate cargo and passenger transportation and ensure interaction between different modes of transportation.

In the context of economic instability and changes in legislation, the relevance of developing and analyzing security management systems in the aviation industry is growing significantly. Aviation, as an open system, is exposed to numerous technical, natural, human, and economic factors that may pose a threat. Therefore, the integration of aviation into global challenges is an integral part of its development, in particular, in the area of expanding transportation at various levels, which contributes to the achievement of economic, social and environmental goals.

The effectiveness of the aviation security system has a direct impact on consumer confidence in air transportation, which in turn can affect demand and profitability of businesses. In this regard, enhancing aviation security through the latest assessment and forecasting methods is critical to reducing the risks associated with undesirable events at air transport facilities.

The topic of the qualification work «Organization of the security management system of enterprises in the aviation industry» is especially important in modern conditions and requires in-depth analysis.

This qualification work aims to study scientific and practical approaches to improving the level of aviation safety and security at enterprises, analyze statistical data on the production and financial activities of «Cargo Logistic Service Ukraine» and develop project proposals to improve the level of safety through the introduction of

aviation security department.

To achieve this goal, the qualification work solves the following tasks:

- study of the features of the organization of aviation security management system at aviation enterprises;

- research of scientific and practical aspects of aviation security assessment and forecasting;

- analysis of the indicators of production and financial activities of «Cargo Logistic Service Ukraine»;

- studying the characteristics of the aviation security system at company;

- development of project proposals for the introduction of an aviation security department at «Cargo Logistic Service Ukraine» LLC.

The purpose of the qualification paper is the further development of theoretical and practical approaches to the management of aviation security system to optimize the strategic and operational activities of aviation enterprises.

The subject of the study is theoretical, methodological and practical aspects of improving the security management system at an enterprise «Cargo Logistic Service Ukraine».

The object of research is the activity of «Cargo Logistic Service Ukraine» LLC.

Research methods: methods of statistical and system analysis, SWOT analysis, expert evaluation, project analysis.

CHAPTER 1

THEORETICAL BASICS OF SECURITY MANAGEMENT SYSTEM ORGANIZATION IN THE AVIATION INDUSTRY

1.1 Concept of an aviation safety management system

Security has always been a fundamental need for all forms of life and inorganic objects, playing a key role in their existence and development. Since ancient times, mankind has sought to ensure security, and this desire has only grown over time. In the twentieth century, the concept of security went through various stages of evolution, taking on numerous forms and aspects, which ultimately led to the emergence of the field of economic security. Modern scientific research in this area is extremely important as it contributes to the stability and prosperity of societies.

In the context of aviation, safety is defined as a state where the risk of harm to people or property is minimized to an acceptable level. This condition is maintained through a continuous process of identifying potential hazards and managing risks, which is critical to ensuring flight safety. To achieve this, leading international organizations, such as the International Civil Aviation Organization (ICAO), the International Air Transport Association (IATA), the European Civil Aviation Conference (ECAA), the European Agency for the Safety of Air Navigation (EUROCONTROL) and others, are constantly conducting systematic research. These organizations are working to develop and improve safety management systems, including regulation, regulatory frameworks, and methodologies, which are aimed at improving safety in the aviation industry on a global level [8].

In other words, it is an activity aimed at preventing threats, recovering operations to protect corporate interests, and maintaining the integrity of processes or systems

through the adoption and development of a security culture. The proposed security mechanisms are a warning of threats before they occur or are realized.

The Safety Management System (SMS) aims to provide aviation services with a comprehensive approach to managing flight safety. It is designed to continuously improve safety through the identification of potential hazards, the collection and analysis of safety data, and continuous risk assessment. The main objective of the SMS is to proactively mitigate flight safety risks before they can lead to aviation events and incidents. This allows airlines to effectively manage their operations, safety and resources, while enhancing their understanding of their contribution to overall safety [7,3].

The study of security and methods of its management, in particular in the context of security management of aviation enterprises, is critically important. The basis for ensuring effective security management is the full legitimacy of the company's activities. This implies that all company operations must be performed in accordance with the law and have the necessary permits, licenses, and other regulatory documents confirming the legitimacy of their activities.

The second key is the application of a systematic approach. This means that all security measures should be integrated and coordinated in such a way as to jointly contribute to the achievement of the overall goal of maximum security. This approach requires enterprises to create comprehensive strategies that include risk management, continuous monitoring and adaptation to changing conditions, thereby ensuring sustainability and flexibility in security management [2].

The development of the aviation safety system can be viewed as a history consisting of three key stages, each of which played an important role in shaping modern approaches to aviation safety:

a) Technical era (1900-1960). This period is characterized by the fact that aviation has become an industry of mass transportation, and violations in the flight safety system were often caused by technical malfunctions. At this time, the focus was on studying and eliminating the technical causes of accidents. Thanks to technical improvements, by the 1950s, accident rates were reduced and the focus of safety

expanded to include rulemaking and oversight.

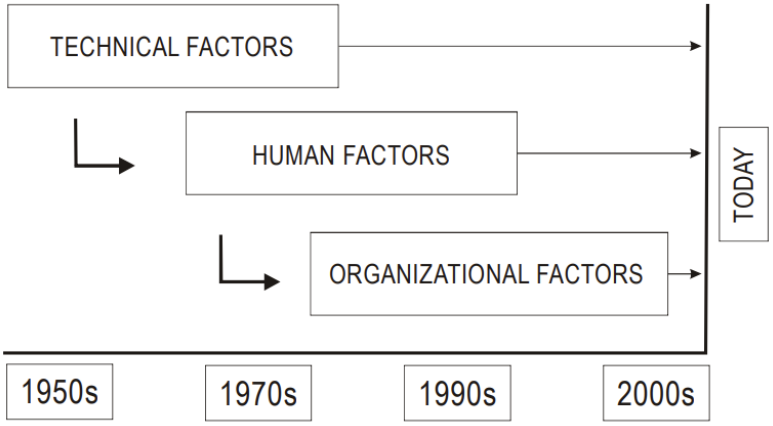


Figure 1.1 – The evolution of safety

Source: [45 p.18]

b) The Human Factors Era (1970-1990). Since the early 1970s, due to significant technological advances, the frequency of aviation incidents has decreased and aviation has become one of the safest modes of transportation. At this time, the emphasis shifted to the study of human performance and human-machine interaction. This has led to the need to consider new aspects of safety that were not previously taken into account. Despite significant efforts to reduce errors, the human factor remained one of the main causes of aviation incidents. Recognition of the complexity of the work environment and the influence of numerous factors on human behavior has been a key point in the development of safety approaches.

c) The Organizational Era (1990s to present). During this period, flight safety began to be viewed as a systemic phenomenon, encompassing organizational, human and technical factors. The concept of "organizationally caused incidents" indicates the impact of organizational culture and policies on the effectiveness of risk management. The traditional approach to data collection and analysis, which was based on the results of investigations, was supplemented by proactive methods. This allowed us to monitor known risks and identify new issues, which contributed to the creation of an effective safety management system [28].

The aviation system, as a complex multi-level structure, has a high level of protection, so that individual internal failures usually do not lead to serious consequences. Security breaches are often the remote result of decisions made at higher levels of management that do not become apparent until certain operational circumstances activate their destructive potential. In these situations, human error or active failures at the operational level can serve as triggers for activating latent conditions that undermine the system's built-in safety features.

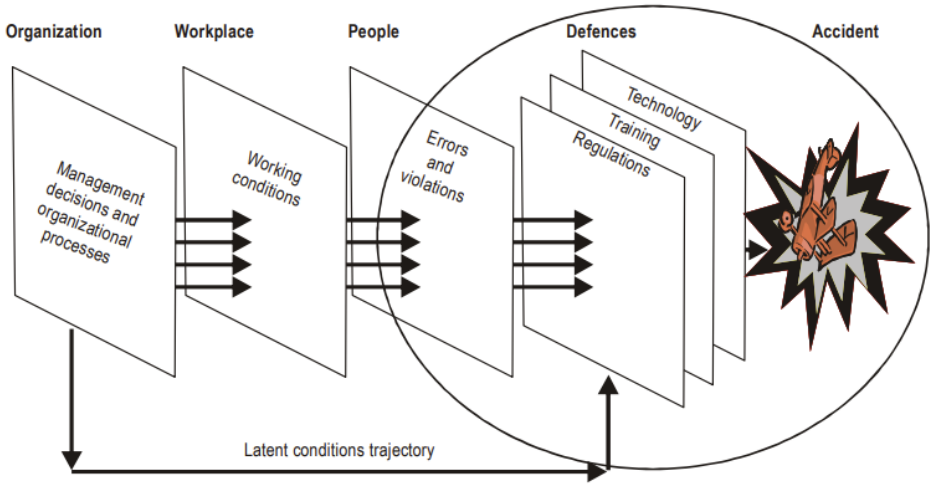


Figure 1.2 – The concept of accident causation

Source: [45 p.19]

The model presented in Figure 1.2 demonstrates the importance of organizational and management factors in determining the causes of aviation incidents. It indicates the presence of various protective mechanisms in the aviation system that are designed to prevent deviations in the actions or decisions of people at all levels. However, despite these defenses, violations that break through all barriers can have catastrophic consequences. Also, during the time leading up to an aviation event, latent conditions exist in the system and can be activated by local factors [28].

To gain a deeper understanding of the concept of an aviation incident, a modular approach can be applied that includes five key building blocks. At the top level of this structure are organizational processes, which cover activities that are directly

controlled by the organization. This includes policy making, planning, information sharing, resource allocation, supervision, etc. Resource allocation and information sharing are two fundamental processes that affect safety. Deficiencies in these processes can lead to disruptions that can occur in two ways.

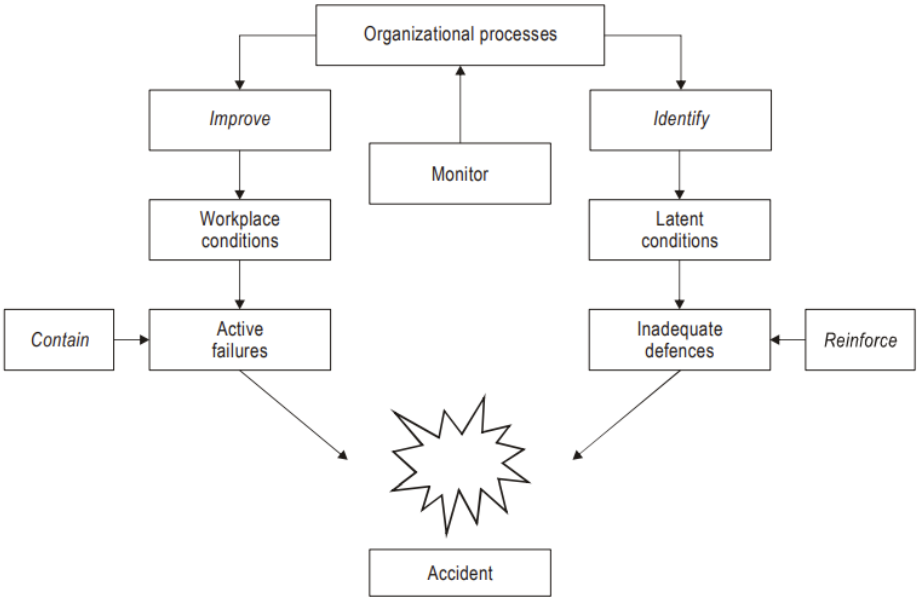


Figure 1.3 – The organizational accident

Source: [45 p.20]

The first pathway is associated with latent conditions, such as deficiencies in equipment design, flawed or erroneous standard operating procedures, and gaps in personnel training. The second pathway is known as normalization of deviations, which indicates situations where exceptions become the norm due to inadequate resources. This can lead to staff responsible for production activities being forced to make compromises, leading to systematic violations of rules and procedures.

Another aspect stemming from organizational processes is workplace conditions. These directly affect the performance of personnel in the aviation industry and include stability, qualifications, experience, morale, trust in management, and traditional ergonomic factors such as lighting, heating, and air conditioning.

Sub-optimal workplace conditions can lead to active failures on the part of staff, which can be viewed as errors or irregularities. In terms of incidents arising from

organizational causes, safety measures should focus on monitoring organizational processes to identify hidden conditions and strengthening protective mechanisms. It is also important to improve workplace conditions to prevent active failures, as it is the interplay of these factors that can lead to safety failures.

1.2 Air cargo secure supply chain

Aviation security measures play a key role in protecting international civil aviation from unlawful interference. Recalling attacks committed or planned against civil aviation using improvised explosive or incendiary devices, it is important to maintain vigilance and take measures to protect air cargo. The security sensitivity of air cargo and mail transportation can be a motivation for criminals. In this context, there are two main threats: improvised explosive or incendiary devices embedded in cargo to be loaded on board an aircraft, and the hijacking of a commercial aircraft to use it as a weapon of mass destruction.

Cargo delivery chains and the processes of moving shipments from origin to destination are often complex and subject to a multitude of regulatory requirements, especially in international air transportation. Air cargo varies in physical and cost characteristics. They can be shipped from anywhere in the world and are typically goods moving from seller to buyer or from shipper to consignee.

As the shipment moves through the delivery chain, it passes through various entities with different responsibilities, including aircraft operators, express carriers, designated operators, registered agents, shippers, consignees, transportation companies and ground handling agents. Before cargo reaches its destination, it may be trans-shipped several times from one flight to another and subject to various procedures and documentation in accordance with legal and commercial requirements. All authorities responsible for flight and aviation safety, crime prevention and the protection of public revenues have an interest in ensuring that their rules are followed. All parties involved

in this complex system share responsibility for ensuring that cargo is protected and operates in accordance with the law. In particular, they have a duty to ensure that nothing in the cargo jeopardizes the aircraft and the lives of those on board [43].

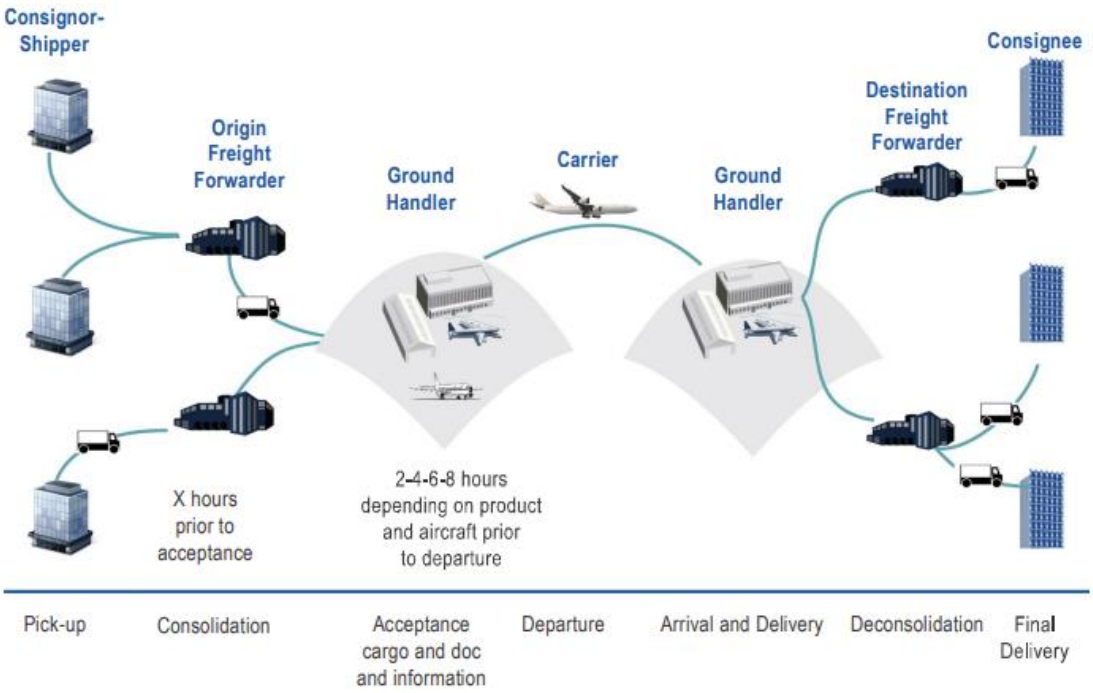


Figure 1.4 – Air cargo movement overview

Source: [43 p.7]

The International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPS) for the protection of the entire air cargo chain have been developed progressively and are now enshrined in Annex 17 «Aviation Security» of the Chicago Convention. This regulatory framework is supplemented by guidance material from the Aviation Security Manual (Doc 8973 - Restricted), especially in its Chapter 13 «Cargo and Mail» as well as other specific guidance documents. The regulatory framework is regularly reviewed and updated to better address constantly evolving threats [31,36].

Main security principles include:

- cargo and mail should be made secure at the point of origin and protected from unauthorized interference;

- the appropriate authority at the point of origin should ensure the application

of appropriate security controls to cargo and mail at the start of their journeys;

- security status should be issued and accompany each consignment to enable the subsequent verification of this status throughout the supply chain;

-the appropriate authority at the point of transfer should satisfy itself that the security controls previously applied to the cargo and mail meet its national civil aviation security programme requirements;

where the appropriate authority is not satisfied that the transfer cargo and mail are secure, appropriate security controls, which may include screening, should be applied in accordance with its NCASP (National Civil Aviation Security Programme) requirements.

According to the regulatory framework, the air cargo delivery chain includes the following players:

1) Aircraft operators are fully responsible for security controls, including 100% inspection of cargo and mail prior to loading on board the aircraft.

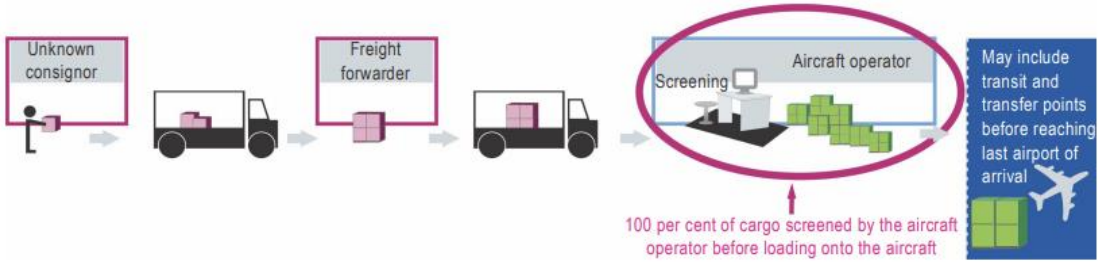


Figure 1.5 – Security controls applied by aircraft operators

Source: [43 p.11]

2) A regulated agent is a freight forwarder or other legal entity (e.g. ground handling agent) that conducts business with the aircraft operator. A regulated agent provides security controls that are recognized or required by the relevant authority. This allows regulated agents to conduct cargo inspections. The aircraft operator may receive cargo that has already been security inspected by a registered agent who is responsible for the security status of cargo shipments. regulated agents are usually authorized to operate at specific locations.

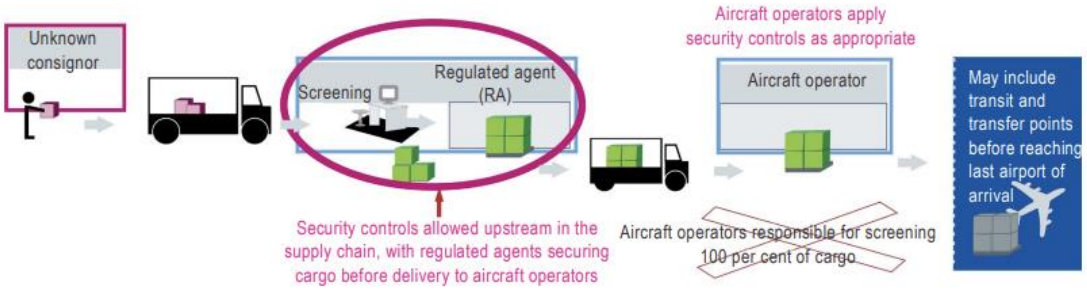


Figure 1.6 – Security controls applied by regulated agents

Source: [43 p.13]

3) Known consignors - legal entities may act as known shippers, sending cargo or mail for their own account. Their procedures must comply with general regulations and security standards to authorize transportation on a commercial aircraft. Once the known consignors have confirmed the security status of the cargo, it can be transferred to a registered agent, another legal entity or directly to the aircraft operator, who are then responsible for its protection until it is loaded on board the aircraft.

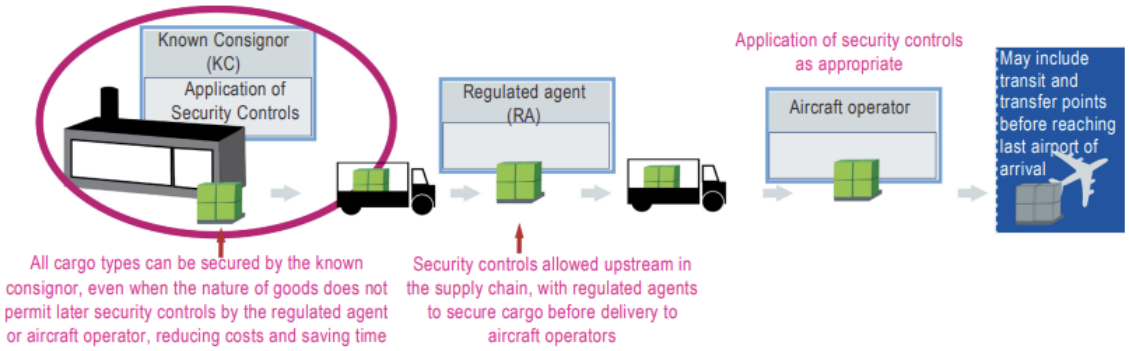


Figure 1.7 – Security controls applied by known consignors

Source: [43 p.13]

For aviation security, screening is the use of technical and other means to detect weapons, explosives or other dangerous devices, objects or substances that could be used to commit acts of unlawful interference. States may use a variety of screening methods to secure air cargo, including manual inspection, x-ray equipment, explosives

detection systems, explosives trace detection equipment, and explosives detection dogs.

The entity protecting the cargo should conduct the inspection using appropriate means and methods, taking into account the nature of the cargo. Not all means or methods are appropriate for all types of cargo. Some shipments may be categorized as high-risk (e.g., intelligence) and in such cases are subject to additional screening or other controls.

As required by Annex 17 of the ICAO, each State designates an appropriate authority for aviation security matters. This authority is usually the Ministry of Transport or the Directorate General of Civil Aviation (Directorate General of Civil Aviation). This authority performs a number of responsible functions and tasks at the national level, including the implementation of standards and recommended practices, the development of air cargo policies and regulations, and risk management for the air cargo chain. It is also responsible for awarding registered agent status to candidate organizations in accordance with the established procedure. The security program developed by the registered agent must fully comply with national requirements and ensure a satisfactory level of security for the cargo to be delivered on board the aircraft [43].

1.3 Analysis of risk threats in the security management system

The aviation industry is exposed to a wide range of risks covering technical, natural, human and economic aspects. Each of these factors can create certain risks, and the key task is to identify and minimize them. Recent events have exposed the excessive sensitivity of global supply chains, particularly in the aviation industry. Movement restrictions, changes in consumer demand, and production shutdowns have become serious challenges for logistics systems and production chains. Risk management is crucial to prepare aviation logistics systems for similar emergencies in

the future.

Risks such as conflicts, terrorist threats, and instability can significantly harm global logistics systems in the aviation industry. They can cause interruptions in transportation routes, changes in trade agreements, and delays in international shipments of goods [10].

In this context, the new Civil Aviation Safety Strategy developed by the International Civil Aviation Organization (ICAO) is an important tool for achieving an acceptable level of safety on a global scale.

The ICAO emphasizes the importance of focusing on aviation security. Understanding and managing these risks is fundamental to ensuring safety, and requires aviation companies to take a rational approach to decision-making to balance risks with the costs of avoidance [47].

In the air transport industry, actions or omissions by employees that are contrary to the interests of the company may pose a threat. Such threats can lead to economic losses, disruptions in the use of technical equipment, non-compliance with the information security regime, undermining business reputation, and problems in relations with partners. Risk in aviation is a combination of threat, vulnerability and consequences. To understand risk, it is necessary to first identify, understand, and identify potential threats to the system.

If threat mitigation measures are insufficient or ineffective, this creates vulnerabilities. The consequences can have both direct and indirect impact if the threat is not addressed properly. Risk assessment requires a detailed identification of probable scenarios, with attention to each type of threat. Threats can be directed at specific infrastructure objects, such as warehouses, documentation, or equipment.

The threat scenario is the basis for risk analysis, including identification and description of the potential act of unlawful interference, its purpose, methods of action, and the threat actor. The probability indicates the chance of such an attack being attempted. The consequences of an attack can be varied and include human, economic, political, and reputational aspects. Identifying existing security measures helps to determine whether they reduce the likelihood of a threat succeeding or mitigate the

consequences if the threat is realized. Knowledge of mitigation measures allows you to assess the level of residual vulnerability.

Based on a combination of probability, consequence, and impact assessments, a residual risk rating can be derived. This final rating can guide policy development and determine whether additional security measures are needed to reduce risks in the civil aviation industry [51].

The process of controlling risk factors in aviation safety begins with an assessment of the likelihood that potential hazards may materialize during the aviation organization's operations. The likelihood of flight safety risks is defined as the chance of occurrence or recurrence of an event that carries a risk. The following questions can be used to assess this probability:

a) Have events similar to the one under consideration occurred in the past, or is this a unique case?

b) What other equipment or components of the same type could have similar defects?

c) How many employees perform these procedures or are affected by them?

d) What percentage of the time is the equipment or procedure in question used?

e) How severe are the organizational, managerial or regulatory consequences that may indicate the presence of more significant risk factors?

Answers to these questions help to identify potential weaknesses and allow for the development of strategies to mitigate risks, thereby improving safety. Collecting and analyzing this information is critical to creating an effective safety management system in the aviation industry [25].

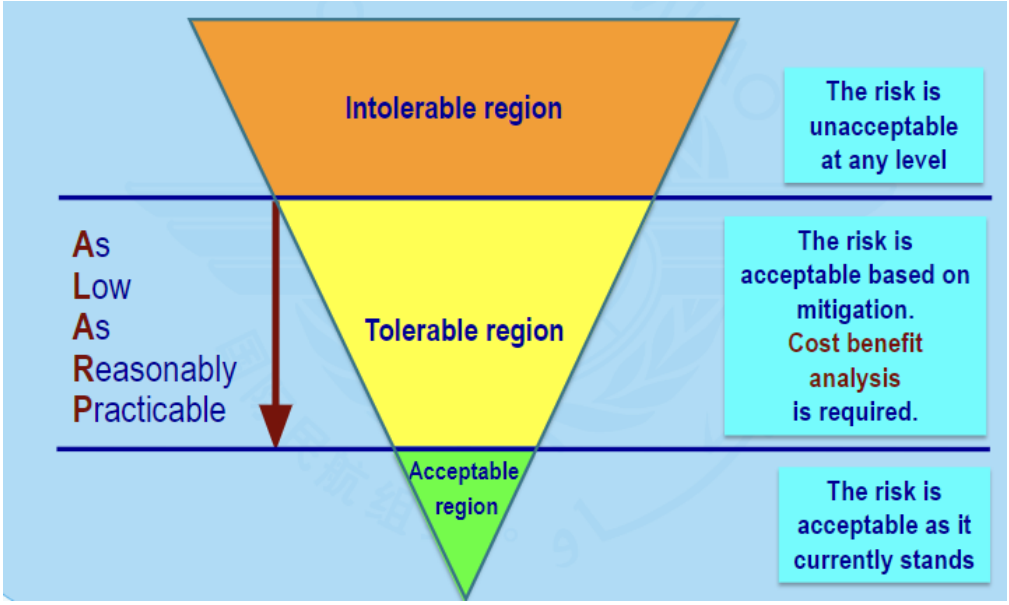


Figure 1.8 – Tolerability description of risk

Source: made by author

The factors that influence risk assessment are key to determining the likelihood of hazardous situations occurring, taking into account all possible scenarios. Analyzing these factors helps to determine the likelihood of safety risks. For example, Table 1.1 may contain five categories that describe the probability of a hazardous event or condition occurring, with a detailed description of each category and a numerical value assigned to each.

Table 1.1 – Safety risk probability

Likelihood	***Meaning***	***Value***
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred infrequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

Source: [45 p.44]

Once the probability has been assessed, the next step is to assess the severity of the safety risks, taking into account all possible consequences associated with the hazard. The severity of the risks is determined by the extent of potential harm that could

be caused as a result of or as a consequence of the identified hazards. The severity rating is based on the following criteria presented in Table 1.2.

Table 1.2 – Safety risk severity

Severity	***Meaning***	***Value***
Catastrophic	- Equipment destroyed - Multiple deaths	A
Hazardous	- A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely - Serious injury - Major equipment damage	B
Major	- A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency - Serious incident - Injury to persons	C
Minor	- Nuisance - Operating limitations - Use of emergency procedures - Minor incident	D
Negligible	- Few consequences	E

Source: [45 p.45]

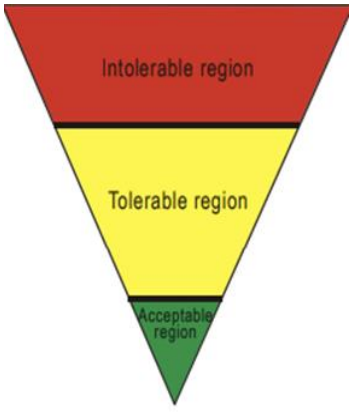
Table 1.3 – Safety risk assessment matrix

Risk probability	Risk severity				
	Catastrophic **A**	Hazardous **B**	Major **C**	Minor **D**	Negligible **E**
Frequent **5**	5A	5B	5C	5D	5E
Occasional **4**	4A	4B	4C	4D	4E
Remote **3**	3A	3B	3C	3D	3E
Improbable **2**	2A	2B	2C	2D	2E
Extremely improbable **1**	1A	1B	1C	1D	1E

Source: [45 p.45]

In the safety risk assessment of an aviation organization, for example, the probability of occurrence of risk factors that may occur «occasionally» is assigned a category of «4». The severity of these risk factors is classified as «hazardous» and is denoted by the letter «B». The combination of these two parameters (4B) creates an integrated risk index that reflects the potential consequences of the identified threat.

Table 1.4 – Safety risk tolerability matrix

Tolerability description	Assessed risk index	Suggested criteria
	5A, 5B, 5C, 4A, 4B, 3A	Unacceptable under the existing circumstances
	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Acceptable based on risk mitigation. It may require management decision.
	3E, 2D, 2E, 1B, 1C, 1D, 1E	Acceptable

Source: [45 p. 47]

The resulting risk index from the flight safety risk assessment matrix should be transposed to the risk acceptance matrix, which defines the acceptance criteria for a given organization. In the example above, a risk factor with a score of 4B is considered «unacceptable based on risk mitigation».

This process allows the organization to determine the level of risk that can be accepted or requires additional risk mitigation measures. It also helps to develop a security policy that takes into account the specifics of the organization's activities and provides adequate protection against potential threats. Risk assessment is a fundamental part of the safety management system that helps to ensure flight safety and the efficiency of aviation operations [28].

In a situation where the security risk impact index is unacceptable, the organization should take the following measures:

- implement strategies that will reduce the likelihood of the risk occurring, i.e.,

reduce the probability component of the risk index;

- develop action plans aimed at reducing the potential damage from the hazard, i.e., reducing the severity component of the risk index;

- stop the relevant activity if risk reduction is not possible.

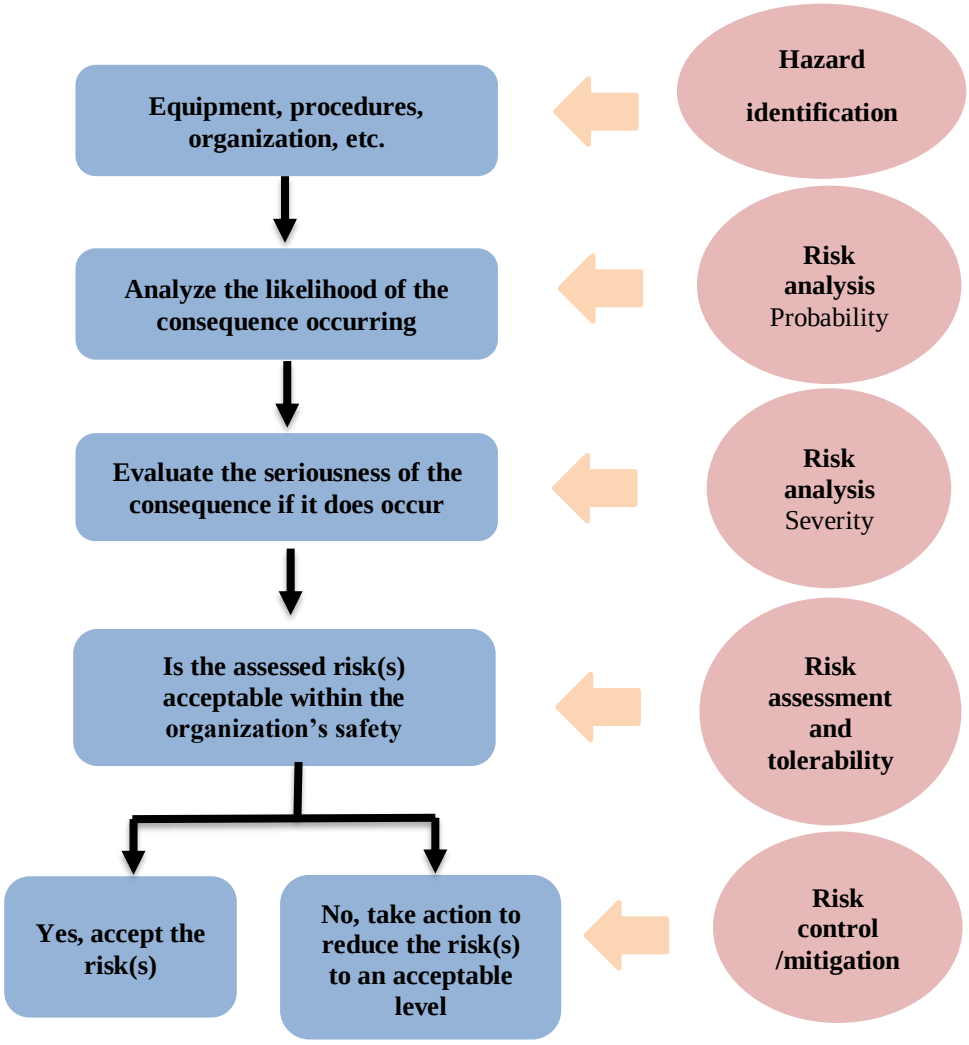


Figure 1.9 – General action plan for aviation safety risk assessment

Source: made by author

While the elimination of aviation incidents or serious events remains the ultimate goal in this area, it is recognized that aviation systems cannot be completely free of risk factors and associated risks. Human activity and the systems in place cannot guarantee the complete absence of operational errors and their consequences. Thus, safety is a dynamic characteristic of the aviation system that requires continuous reduction of flight safety risks. It is important to keep in mind that safety performance indicators

often depend on domestic and international regulations, as well as cultural characteristics. As long as safety risks and operational errors are kept under reasonable control, aviation, as an open and dynamic system, can be effectively managed, striking the right balance between the production of new aircraft and the protection of passengers and cargo [41].

1.4 Security management strategy in the aviation industry

Ensuring safety in aviation has been one of the most important challenges since the beginning of the aviation era. Despite significant progress in the development of technology, avionics, engines and navigation systems, the issue of safety remains relevant and requires constant attention. The International Civil Aviation Organization (ICAO) is dedicated to promoting the safe and orderly development of international civil aviation by developing standards and recommended practices that form the basis for the sustainable development of the global aviation industry [31,32].

In response to current challenges, ICAO emphasizes the need to update the global approach to aviation security. To this end, an Annex 19 to the Convention on International Civil Aviation was introduced, focusing on aviation safety management. This document brings together standards and recommended practices from six different annexes to strengthen the role of the State at the highest level, ensure legal unity, develop consistent standards for diverse resources, improve the identification and development of future needs, and organize cooperation between ICAO and other international and regional aviation organizations, including the European Union and the European Safety Agency. The implementation of new ICAO strategies is key to ensuring global civil aviation safety, given the ever-increasing demands on flight safety and the need to adapt to the rapidly changing conditions of the modern world [18].

Implementation of a secure supply chain is a key solution based on a risk-based approach and aimed at achieving the following goals:

- ensuring the fulfillment of existing obligations of companies involved in the air cargo supply chain;

- sharing costs and responsibilities among all stakeholders and ensuring cargo security at all stages of the supply chain to reduce the burden on airline operators;

- facilitate the flow of cargo transported by air and reduce possible delays due to security measures;

- implementation of specialized security measures for categories of cargo that are not subject to routine inspection due to their characteristics;

- maintaining the key benefits of air transport, such as speed, safety and reliability.

These measures reflect ICAO's global commitment to aviation safety and continuous improvement, which is essential to ensure the safety and efficiency of aviation operations worldwide.

Safety management in the aviation industry requires a comprehensive approach that includes reactive, proactive and predictive methods.

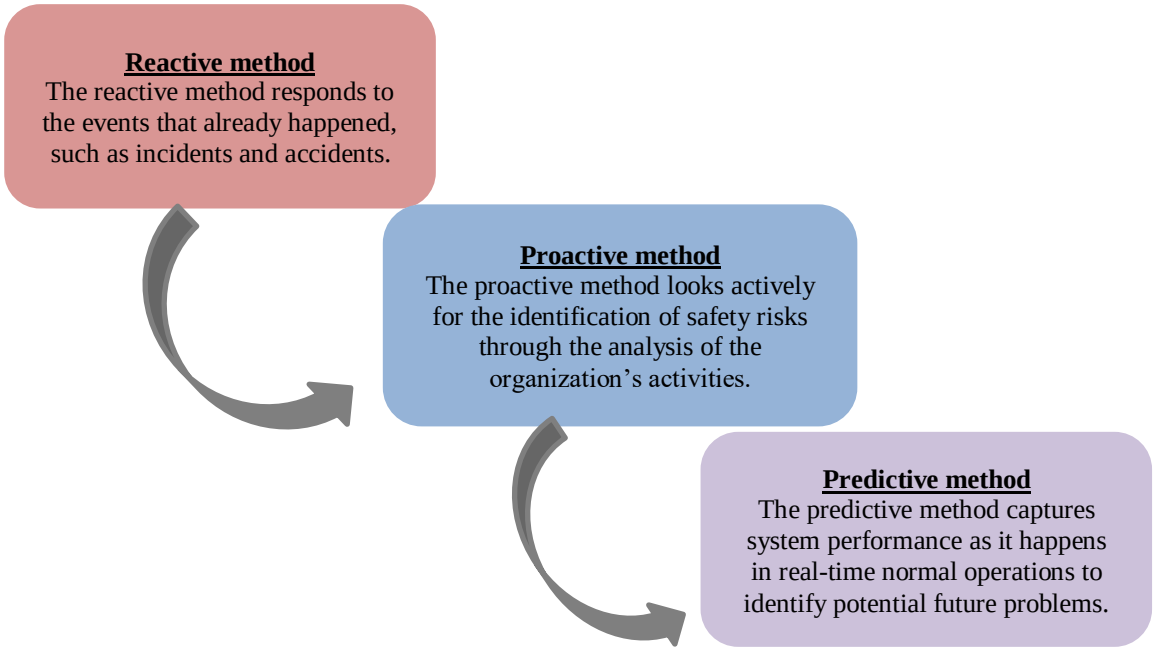


Figure 1.10 – Methods of safety management in aviation

Source: made by author

Reactive methods are based on the analysis of events that have already occurred, such as incidents and accidents. They include collecting data about incidents, documenting them, investigating the causes, and developing response measures. The main goal is to identify the causes of problems and prevent them from happening again. This may include staff training, updating procedures, or upgrading equipment.

Proactive methods aim to identify and manage risks before they lead to incidents. This includes regular safety assessments, monitoring work standards, and analyzing potential weaknesses in security systems. It may include safety audits, risk awareness training, and the implementation of early warning systems.

Predictive methods use data on current system performance to predict future risks. This includes trend analysis, real-time monitoring of security metrics, and the use of statistical methods to identify potential problems. Such methods allow organizations to adapt to changes in the environment and technology, which can improve overall security.

The combination of these three strategies creates a multi-layered safety management system that allows aviation enterprises to be prepared for different scenarios and respond effectively to safety-related challenges. The use of these strategies also promotes a safety culture where safety is a priority at all levels of the organization [27,28].

Table 1.5 – Components and elements of the SMS framework

COMPONENT	ELEMENT
1. Safety policy and objectives	1.1 Management commitment
	1.2 Safety accountability and responsibilities
	1.3 Appointment of key safety personnel
	1.4 Coordination of emergency response planning
	1.5 SMS documentation
2. Safety risk management	2.1 Hazard identification
	2.2 Safety risk assessment and mitigation
3. Safety assurance	3.1 Safety performance monitoring and measurement
	3.2 The management of change
	3.3 Continuous improvement of the SMS
4. Safety promotion	4.1 Training and education
	4.2 Safety communication

Source: [46 p.146]

The role of management in aviation safety is critical to the effectiveness of aviation safety, and is supported by safety policies and objectives. Management's commitment to safety is demonstrated through decision-making and resource allocation, which should always be aligned with safety policy, fostering a positive safety culture.

Service providers must manage safety risks throughout the delivery process. Potential risks can arise from systemic defects in design, specifications, user interface, or interaction with other processes and systems. They can also arise if existing processes or systems fail to adapt to changing operating conditions. A thorough analysis can identify potential risks at any stage of operation or life cycle. Sources of information for identifying risks include:

- the use of observation techniques to monitor day-to-day operational activities;
- automated recording systems to monitor parameters that can be analyzed;
- the ability for everyone, including employees of external organizations, to report potential risks and other issues;
- inspections to identify risks associated with the task or process being audited. Coordinate audits with organizational changes to identify risks associated with innovations;
- an interactive staff training process can help identify risks through the information received from participants.

These methods are part of a comprehensive safety management approach that identifies and minimizes risks, ensuring flight safety and efficient aviation operations.

Creating an effective working environment where every employee is aware of their role in ensuring flight safety is crucial to the successful operation of an airline. This becomes especially important when employees, in the course of their duties, not only take into account potential safety risks, but also actively report any identified hazards, errors and threats, thereby contributing to the identification and management of associated risks.

The company's management should ensure that employees are fully aware of

safety-related risks, are provided with the necessary personal protective equipment, and are protected in the event of a safety disclosure through the safety reporting system. An effective safety culture promotes harmonization of diverse national and professional cultures within an organization.

Aviation professionals, through the processes of selection, training, practical experience and peer influence, tend to adopt the value system and behaviors that are specific to their professional community. An effective professional culture reflects the ability of professional groups to distinguish between safety performance issues and contractual or industry objectives. A true professional culture is characterized by the collaborative efforts of all professional groups in an organization to address safety issues, which is key to creating a safe aviation environment [46].

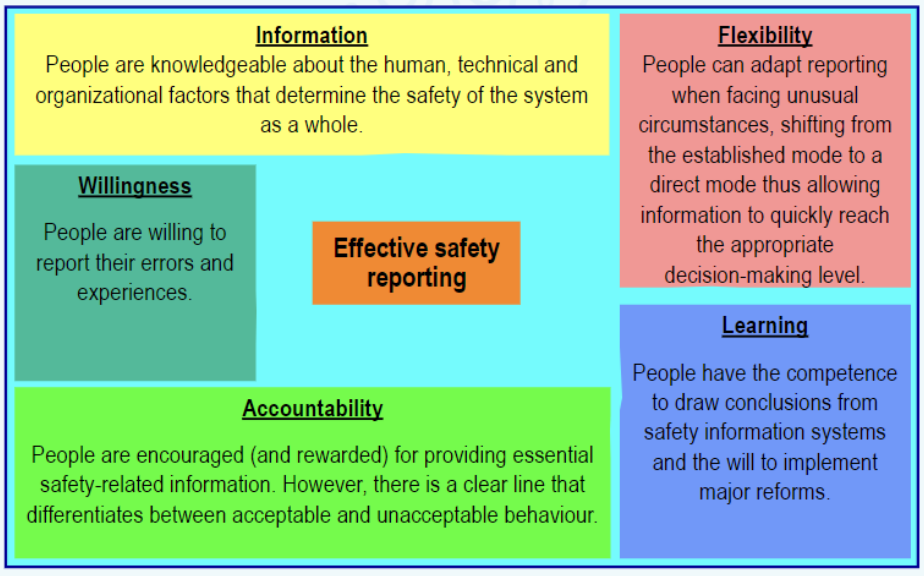


Figure 1.11 – Effective safety reporting

Source: made by author

The aviation safety management process at aviation companies is a systematic and proactive approach aimed at preventing aviation hazards. It includes several key stages, each of which is important for ensuring the reliability and safety of flights.

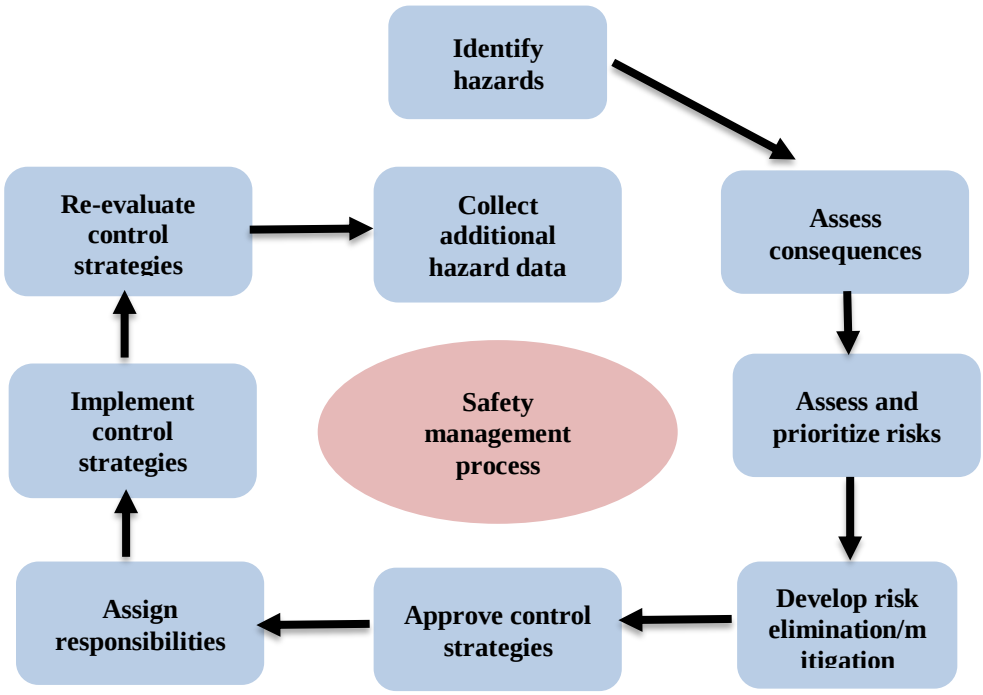


Figure 1.12 – Safety management process

Source: made by author based on [27]

The first stage is hazard identification, which involves identifying all potential sources of risks that could lead to aviation accidents. Hazards may be related to technical factors (equipment malfunctions), human factors (violations of rules), and economic aspects (underfunding of the industry, pressure on personnel, savings on safety measures).

The second stage involves collecting additional data on the identified hazards. This may involve analyzing data on aviation accidents, reviewing technical documentation, conducting inspections and audits, and interviewing personnel to obtain more detailed information.

The next step is hazard consequence assessment, which assesses the likelihood of aviation events, accidents and disasters, as well as their potential consequences, and involves the development of safety management strategies aimed at preventing aviation events, accidents and disasters. Strategies may include the introduction of new methods and technologies for ensuring flight safety, advanced training of aviation personnel, and improvement of flight safety management systems.

At the fifth stage, the developed safety management strategies are implemented.

This may include the introduction of new systems and procedures, training programs for aviation personnel, inspections and audits, and modernization.

Finally, the safety management strategies and their effectiveness are to be reassessed. This may involve analyzing data on aviation accidents, conducting inspections and audits, and surveying personnel. Based on the results of the reassessment, the strategies can be updated or finalized.

In every service organization, productivity and safety risks are closely linked. As production volumes increase, safety risks can also increase if sufficient resources are not provided or measures are not implemented to improve process efficiency. The organization should set production and safety objectives, finding the right balance between productivity and safety risks. When setting production targets, it is also important to consider the safeguards to control safety risks.

For product manufacturers and service providers, the main defenses are equipment, training, and internal policies and procedures. For public authorities, the main safeguards are similar: employee training, proper use of equipment, effective supervision, and appropriate internal rules and procedures. The safety space is the area within which an organization balances the desired level of performance with protection through a safety risk management system. Organizations must not only define, but also continuously review their risk management strategies to adapt to changing conditions and ensure continuous improvement in safety.

1.5 Chapter 1 summary

The first chapter provided a theoretical framework for safety and security systems in the aviation industry. This study emphasizes the evolution, necessity and complex design of these systems to ensure optimal safety standards.

The goal of a Safety Management System is to improve the safety of an aviation system through systematic hazard identification, data collection, and continuous risk

assessment. This approach is crucial for anticipating and mitigating risks long before they manifest themselves as incidents or accidents at aviation enterprises. SMS is designed to help aviation enterprises manage their safety processes in a structured, methodical way, thereby improving overall safety performance and resource management.

Effective aviation safety and security management relies on sound policies and objectives, as well as a strong commitment from management to prioritize safety in decision-making and resource allocation. Such a commitment is essential to fostering a positive safety culture and ensuring that all employees understand their role in maintaining safety. It also emphasizes the importance of a proactive, systematic approach to risk management, the integration of different safety strategies, and the key role of management in shaping organizational culture.

Together, these elements contribute to the main goal of improving security in the aviation industry, ensuring both the protection and efficient operation of aviation enterprises.

CHAPTER 2
STUDY OF THE ACTIVITIES OF THE «CARGO LOGISTIC SERVICE UKRAINE» COMPANY IN THE MARKET OF TRANSPORT AND FORWARDING SERVICES

2.1 General characteristics of the «Cargo Logistic Service Ukraine» LLC

«Cargo Logistic Service Ukraine» LLC is a Ukrainian freight forwarding company specializing in international cargo transportation, in particular in the air cargo segment. Thanks to its experience and professionalism, the company offers comprehensive logistics solutions that meet a wide range of global logistics needs.

Established on July 2, in 2015 as a limited liability company, the company has a share capital of UAH 10,000.00. The founder and sole owner is Sergiy Karpenko, and the company's chief executive officer is Igor Babyar. Legal Address: 39-a Lobanovskogo ave., Kyiv, 03110, office 3. [29].

«Cargo Logistic Service Ukraine» is known for its individual approach to each client, developing integrated freight forwarding solutions, project logistics and relocation plans that take into account the unique needs and requirements of customers.

The company strives to achieve the highest quality of service by analyzing the specific goals and requirements of its clients, which allows it to provide services with a high degree of consistency and reliability. The company stands out in the Ukrainian market as one of the few companies currently offering specialized air cargo services, providing high-quality service regardless of the complexity of the tasks.

Figure 2.1 – Logo of the company «Cargo Logistic Service Ukraine»

Source: made by the author

The company's portfolio of services includes not only direct deliveries, but also comprehensive cargo support, international multimodal transportation, combining land, sea and air transport, trilateral transportation, air and ocean consolidation services, customs clearance, storage, as well as packaging and delivery of goods.

«Cargo Logistic Service Ukraine» assumes full responsibility for the safety of the cargo, its timely delivery and integrity, guaranteeing the fulfillment of the terms of the contract with the client. See Fig. 1.2 for the range of the company's main businesses.

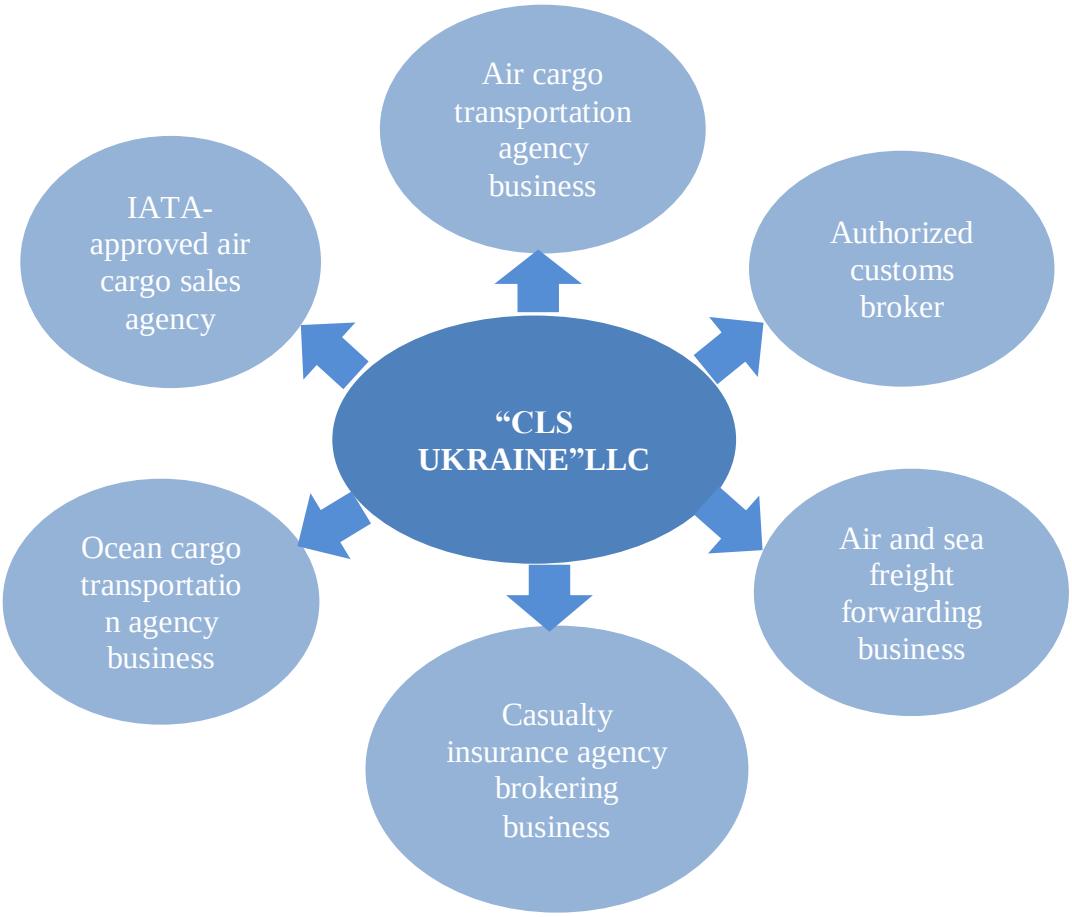


Figure 2.2 – The range of businesses of «Cargo Logistic Service Ukraine»

Source: made by the author

The main destinations for cargo transportation are Europe, the United States, the United Arab Emirates, Turkey, Georgia, Kazakhstan, Moldova, Azerbaijan, Armenia, etc.

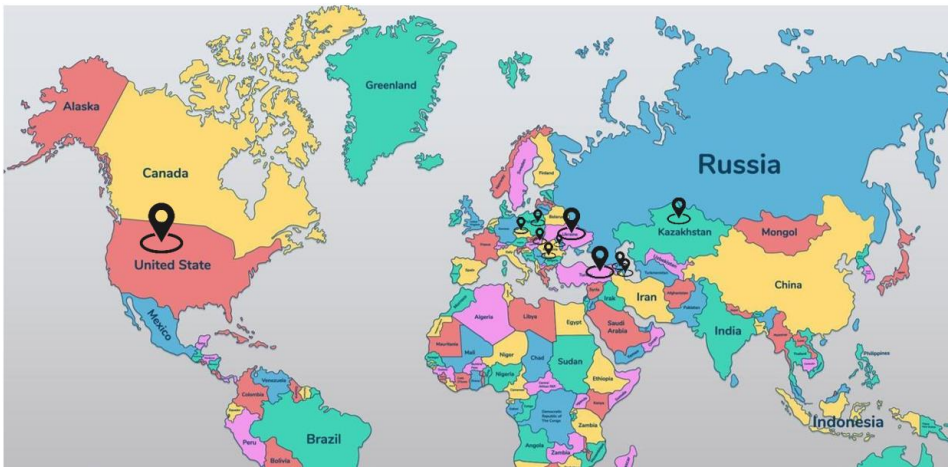


Figure 2.3 – Main directions of transportation of «Cargo Logistic Service Ukraine»

Source: made by the author

The company is a cargo sales agent for such airlines as: «Ukraine International Airlines», «SkyUp Airlines», «Bravo Airways», «Turkish Airlines», «LOT Polish Airlines», «Flydubai», «Pegasus Airlines».

«Cargo Logistic Service Ukraine» LLC is distinguished by its wide range of logistics services, covering the transportation of various categories of cargo. Thanks to its experience and professionalism, the company specializes in the transportation of general cargo, consumer goods and products of individual entrepreneurs. In addition, it has extensive experience in working with projects involving the transportation of perishable goods, such as fresh berries or animal meat, ensuring their freshness and quality from producer to consumer. Also, the transportation of aircraft parts and live animals, from pets to bees, ensuring their well-being and comfort throughout the

journey.

The list of major and frequent clients includes companies represented in Ukraine as:

- «Econia» is an innovative company that specializes in the production of drinking water and baby food. They produce such brands as Malatko, Akvulia, Chystyj Klyuch and have production facilities in Ukraine.

- «Agrovesna Cooperative» is an agricultural cooperative that can grow and sell agricultural products and is one of the leaders in the berry business in Ukraine;

- «Avangardco» is one of the leading agro-industrial companies in Ukraine, specializing in the production and sale of eggs and egg products;

- «Voda UA» is a Ukrainian brand of table water produced in mountain water intakes and springs of the Carpathian regions;

- «MHP» is one of the largest chicken producers in Europe and a leading agro-industrial holding in Ukraine;

- «SkyUp Airlines» is a Ukrainian airline that offers both charter and scheduled flights.

The company uses a line-functional management structure (see Fig. 1.4). A line-functional management system is a type of organizational structure characterized by a clear hierarchy, functional specialization, and centralized decision-making.

It is a typical organizational structure where the company's management consists of heads of various departments (line units), each of whom is responsible for performing certain functional duties. There is a clearly defined chain of command where everyone reports to the same manager. This facilitates coordination and control, and clearly defines responsibility for each task. This system divides functions and responsibilities according to their purpose, which helps to optimize production processes and increase management efficiency. Strategic decisions are made by senior management, while tasks are delegated to lower levels. This helps in more effective decision-making, as managers have a better picture of the company's overall strategy [5].

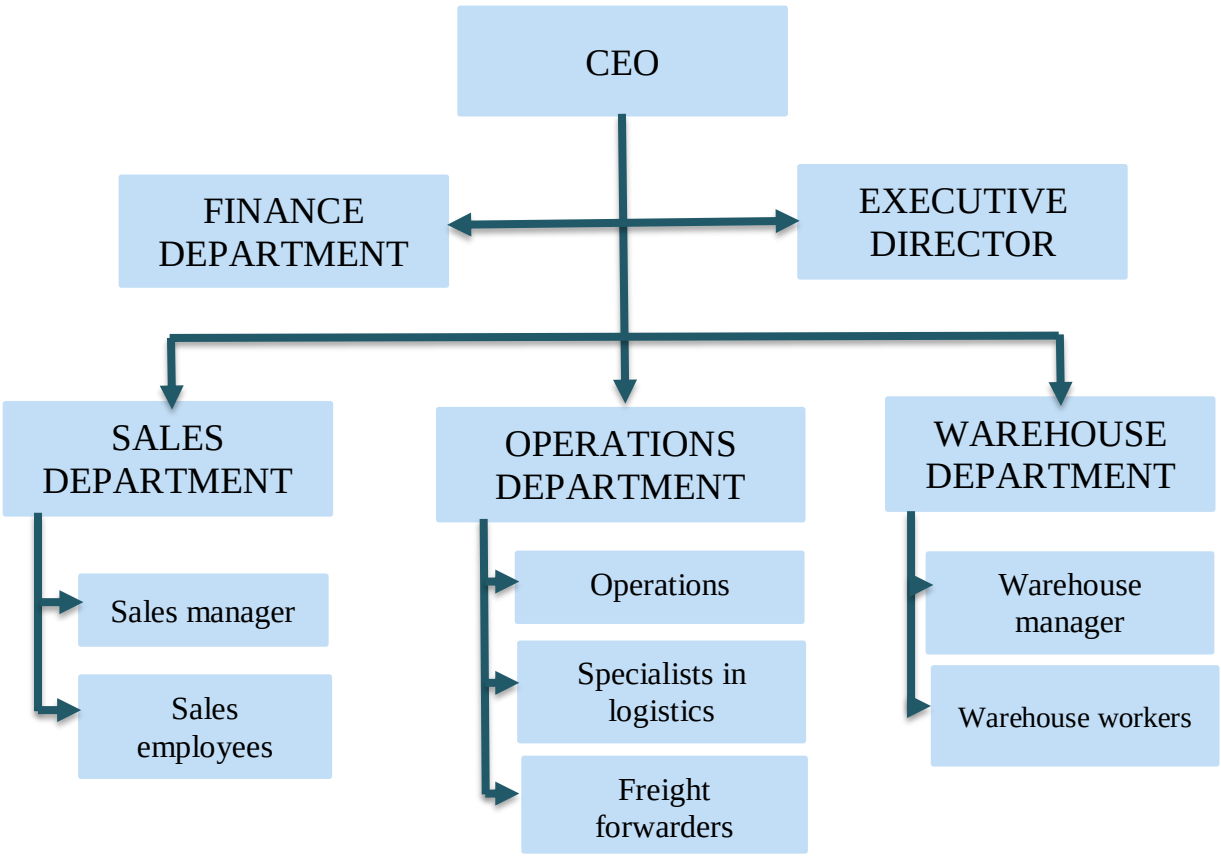


Figure 2.4 – Organizational structure of the company «Cargo Logistic Service Ukraine»

Source: made by the author

For a small air freight forwarding company, a line-functional management system can be quite effective, as it allows for a clear division of functions and responsibilities among employees according to their competencies and skills.

Due to the limited number of management levels, the information flow between management and employees is fast and without unnecessary formalities, mainly through direct oral communication. When necessary, the CEO initiates meetings with department heads to explain strategic goals, set specific tasks and determine how to accomplish them. The heads of departments, in turn, ensure that these directives are disseminated to their subordinates, ensuring that the tasks are clearly understood and implemented.

At the operational level, employees have the opportunity to directly address their direct supervisors with any questions, concerns or suggestions that may arise during the work process. This ensures two-way communication and allows management to

respond quickly to changes and improve workflows, maintaining high levels of productivity and employee satisfaction.

The key role in the management structure of «Cargo Logistic Service Ukraine» LLC is played by the Executive director and the Accounting department, which form the basis for the effective management of all aspects of the company's activities. The Executive director, as a strategic leader, sets the overall goals and directions of development, while the accounting department ensures financial stability and transparency of economic processes.

The Sales team works directly with customers, making sales and maintaining long-term relationships with clients. The Operations department is responsible for planning and coordinating logistics operations and routes and ensuring timely delivery of goods. The warehouse division manages warehouse operations and is responsible for storing, packing and shipping goods.

Managers of the various departments, together with their teams, are an integral part of the organizational structure, responsible for performing specific tasks and achieving goals in their areas of responsibility. They act in accordance with clearly defined job descriptions and instructions, which ensures that work processes are organized and efficient.

The company's control system is based on a well-established feedback mechanism that allows management to receive up-to-date information on the status of work plans and progress in achieving the set goals. This facilitates the timely detection and correction of any deviations from the planned course, and allows you to make the necessary adjustments to improve overall productivity [11].

2.2 Analysis of the economic and financial state of the enterprise`s activity

Analysis of financial indicators is a key element in assessing the performance of any company. In a highly competitive and changing market environment, such review

allows not only to identify the current state of affairs, but also to identify potential opportunities for growth and optimization of business processes.

Financial analysis is an important tool for assessing the economic efficiency of an enterprise, providing an opportunity to predict its financial future based on the data contained in the accounting and financial statements, as well as operational indicators. The main purpose of this analysis is to provide a comprehensive and objective assessment of the company's financial condition, identify key areas for improving its performance and increasing profitability.

Due to its small size and limited resources, the company plays an important role in the supply chain, ensuring efficient and fast delivery of goods by air. However, in order to succeed in the face of constant competition, they must constantly evaluate their activities and make the necessary adjustments.

In the case of «Cargo Logistic Service Ukraine» LLC, the analysis of financial indicators involves an in-depth study of the company's financial situation in order to assess the results achieved over three years. This process involves the application of various methods of statistical, economic and financial analysis. The results of the analysis allow us to determine the economic potential of company, to identify trends and changes in financial activities.

First of all, it is necessary to conduct a horizontal and vertical analysis of the company's balance sheet (Table 2.1).

Table 2.1 – Horizontal and vertical analysis of «Cargo Logistic Service Ukraine» LLC for 2019-2023

Indicator	2019		2020		2021		2022		2023		Deviation 2023 / 2022	
	thousand UAH	%	thousand UAH	%	thousand UAH	%	thousand UAH	%	thousand UAH	%	thousand UAH	%
1	2		3		4		5		6		7	
Non-current assets	0	0,00 %	0	0,00 %	0	0,00 %	0	0,00 %	0	0,00 %	0	0,00 %

The end of the Table 2.1

1	2		3		4		5		6		7	
Current assets	243,7	100,00 %	150	100,00 %	230,1	100,00 %	462,7	100,00 %	383,1	100,00 %	-79,6	-17,20 %
Total assets	243,7	100,00 %	150	100,00 %	230,1	100,00 %	462,7	100,00 %	383,1	100,00 %	-79,6	-17,20 %
Shareholders' equity	24,9	10,22 %	-194	-129,33 %	-120,6	-52,41 %	-43,4	-9,38%	-28,8	-7,52%	14,6	33,64 %
Long-term liabilities and provisions	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00 %
Current liabilities	218,8	89,78 %	344	229,33 %	350,7	152,41 %	506,1	109,38 %	411,9	107,52 %	-94,2	-18,61 %
Total liabilities	243,7	100,00 %	150	100,00 %	230,1	100,00 %	462,7	100,00 %	383,1	100,00 %	-79,6	-17,20 %

Source: made by the author based on the financial statements and [14,15,16]

Analyzing the financial balance sheet of «Cargo Logistic Service Ukraine» for the period of 2019-2023, we can see significant fluctuations in the structure of assets and liabilities. The total assets of the company consisted exclusively of current assets, which indicates the absence of long-term investments or non-current assets. This may be a sign that the company is focusing on short-term operations that ensure a quick turnover of funds. However, such an asset structure may also indicate an underinvestment in long-term projects that could potentially ensure sustainable growth. The significant increase in current assets in 2022 to UAH 462,7 thousand reflects a positive development, but in 2023 there is a decrease to UAH 383,1 thousand, which may be due to a decrease in the volume of activities or difficulties with working capital.

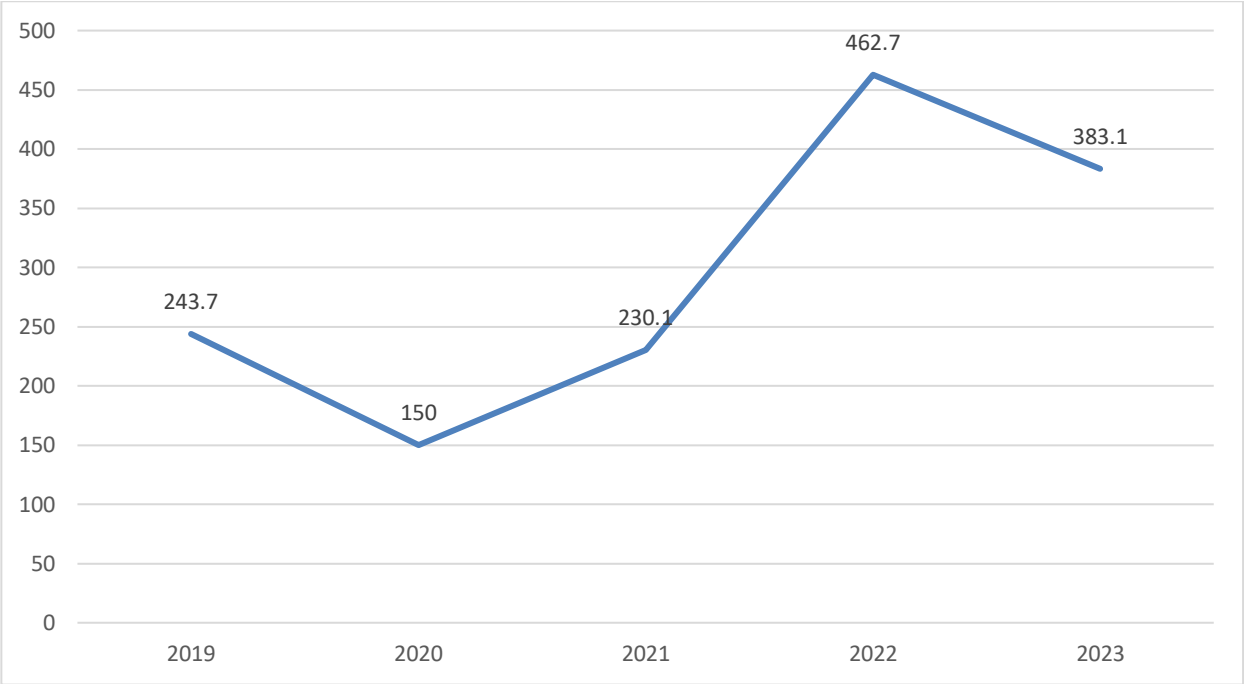


Figure 2.5 – Dynamics of changes in company assets

Source: made by the author

Analyzing the structure of current assets of «Cargo Logistic Service Ukraine» for the period of 2019-2023 (Fig. 2.6), we can note significant changes in their composition and value. In 2019, current assets amounted to UAH 243,7 thousand, of which the main components were receivables for goods (UAH 78,7 thousand), other current receivables (UAH 95 thousand) and other current assets (UAH 70 thousand). This indicates that the company relied heavily on accounts receivable to finance its operating activities, while cash and cash equivalents and inventories were not available.

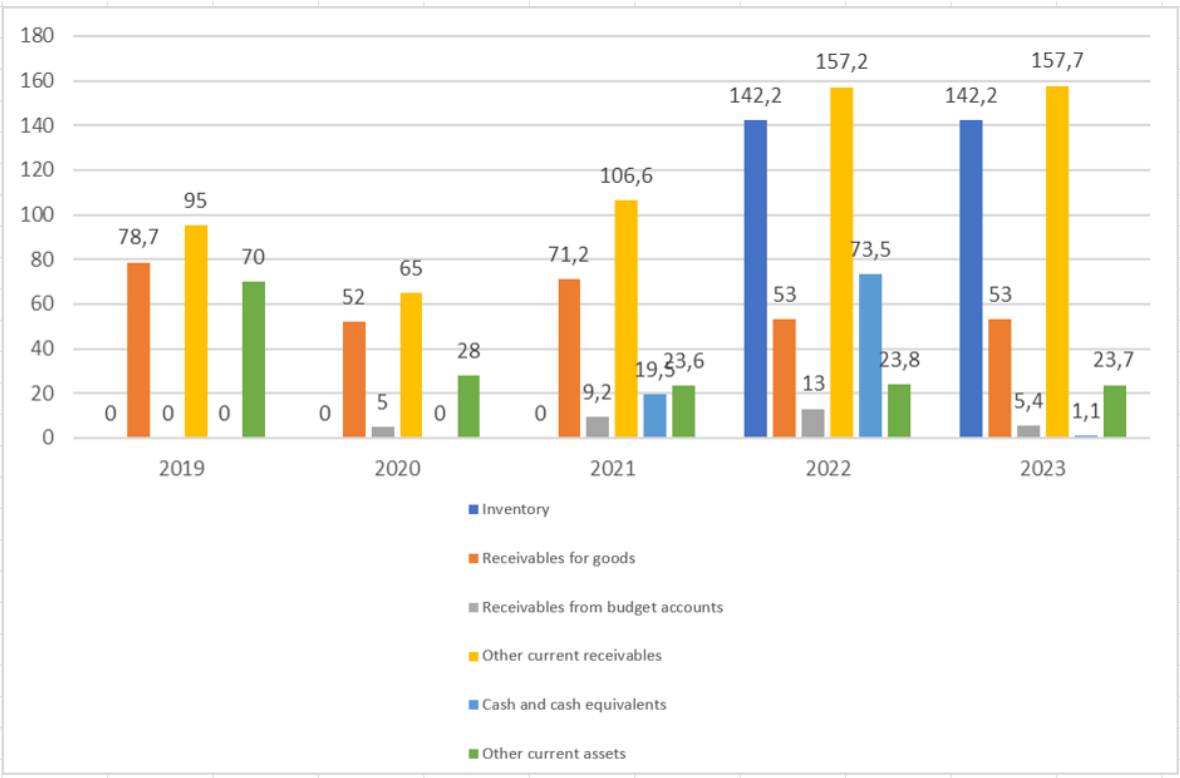


Figure 2.6 – Structure of current assets of the enterprise

Source: made by the author

In 2020, there was a decrease in current assets to UAH 150 thousand, which is explained by a significant decrease in all components, including receivables for goods (UAH 52 thousand) and other current receivables (UAH 65, thousand). However, receivables for payments to the budget (UAH 5 thousand) have been added. This structure may indicate a decrease in business activity or problems with working capital. In 2021, current assets increased to UAH 230,1 thousand, with a significant portion made up of other current receivables (UAH 106,6 thousand) and receivables for goods (UAH 71,2 thousand), reflecting the company's recovery. Also, cash and cash equivalents (UAH 19,5 thousand) appear, which has a positive impact on liquidity.

In 2022, the structure of current assets underwent significant changes, increasing to UAH 462,7 thousand. A significant part of the assets is now represented by inventories (UAH 142,2 thousand) and other current receivables (UAH 157,2 thousand). This indicates an increase in inventories to ensure future operations and active lending to customers. Cash and cash equivalents also increased to UAH 73,5 thousand, which improves financial stability. Other current assets remained almost

unchanged (UAH 23,8 thousand).

In 2023, current assets decrease to UAH 383,1 thousand. Inventories remain at the level of UAH 142,2 thousand, which indicates a stable level of inventories. Receivables for goods and other current receivables amount to UAH 53 thousand and UAH 157,7 thousand, respectively. Cash and cash equivalents are significantly decreasing to UAH 1,1 thousand, which may indicate the use of cash reserves for current needs or insufficient cash inflows. Receivables from settlements with the budget decrease to UAH 5,4 thousand. Such a structure of assets indicates risks associated with low liquidity, which may affect the company's ability to fulfill its obligations in a timely manner.

The company's liabilities have also changed significantly (Fig. 2.7).

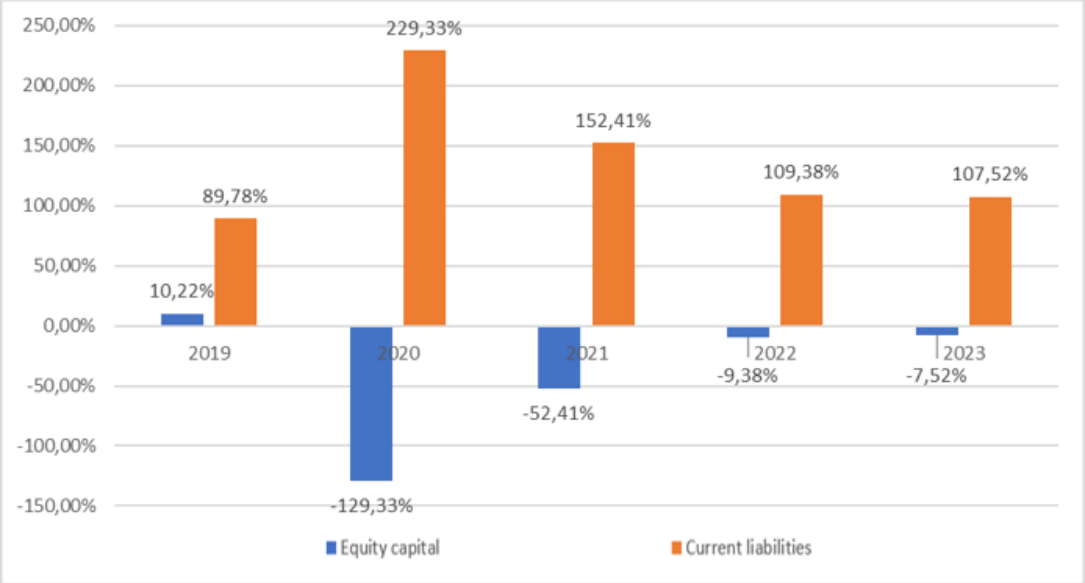


Figure 2.7 – Dynamics of the company's liability's structure

Source: made by the author

Thus, the company's equity has undergone significant changes during the analyzed period. From a positive value of UAH 24,9 thousand in 2019, it moved into the negative zone in 2020 (-194 thousand), which indicates losses or other financial losses. Despite the improvement to -120,6 thousand UAH in 2021 and a further decrease in the negative value to -28,8 thousand UAH in 2023, equity remains negative. This indicates the inability of the company to fully cover its liabilities with its own

resources, which may pose a risk to creditors and investors.

Considering the structure of the equity capital of «Cargo Logistic Service Ukraine» for the period of 2019-2023 (Fig. 2.8), it is noticeable that the registered (share) capital remains unchanged at the level of UAH 10 thousand for all five years. This indicates stability in initial investments and the absence of additional attraction of equity capital during this period. However, the dynamics of retained earnings (or uncovered loss) demonstrates significant fluctuations, which significantly affects total equity.

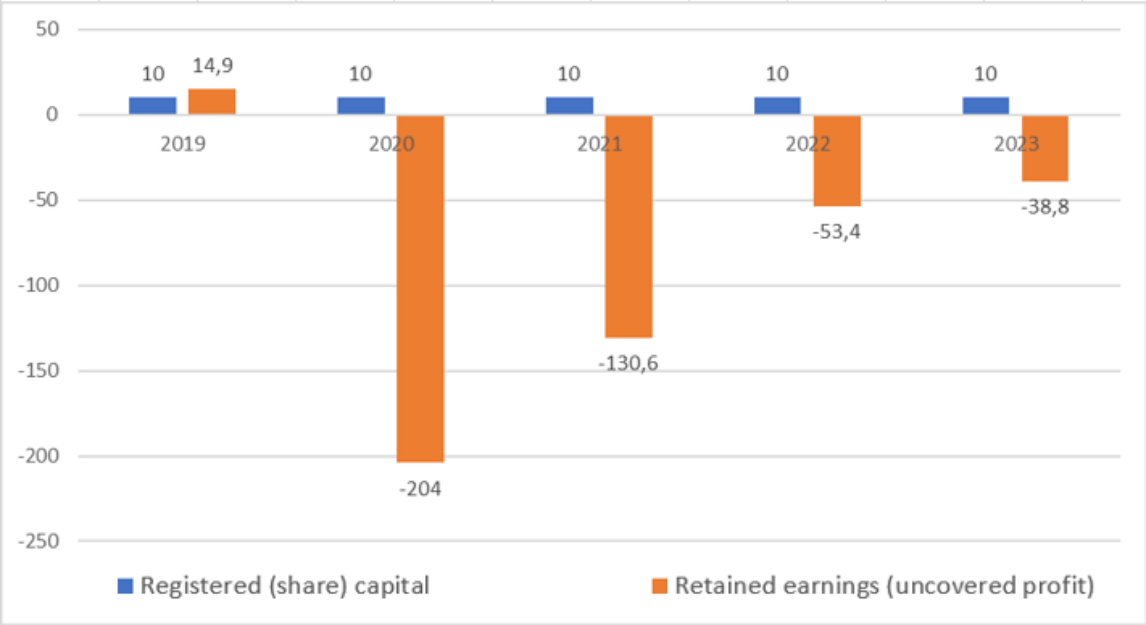


Figure 2.8 – Dynamics of the company's equity capital structure

Source: made by the author

In 2019, the company had positive retained earnings of UAH 14,9 thousand, which, together with the registered capital, amounted to UAH 24,9 thousand of equity. This indicates that the company was profitable that year. However, in 2020, the situation deteriorates sharply: the retained loss increases to UAH -204 thousand, which leads to a total negative equity of UAH -194 thousand. Such a change may be caused by significant financial losses or other negative economic events that have significantly affected the company's financial position. In 2021, equity slightly improves as retained loss decreases to UAH -130,6 thousand, indicating a certain reduction in losses or

partial coverage of previous losses. However, total equity remains negative (-UAH 120,6 thousand), indicating continued financial difficulties. In 2022, there is a further improvement, when the retained loss decreases to -53,4 thousand UAH. This shows that the company is gradually reducing its losses, approaching positive equity. In 2023, the situation improves even further, when the retained loss is reduced to -38,8 thousand UAH. Although total equity is still negative (-UAH 28,8 thousand), the trend of decreasing losses is positive. These changes indicate that «Cargo Logistic Service Ukraine» is making efforts to improve its financial health and is gradually improving its financial stability.

Speaking about other elements of the liability, the analysis of current liabilities of «Cargo Logistic Service Ukraine» for the period of 2019-2023 shows significant changes in their structure and amount (Fig. 2.9). In 2019, the total amount of current liabilities amounted to UAH 218,8 thousand, where the main part was made up of other current liabilities (UAH 144,2 thousand) and liabilities for goods (UAH 65,4 thousand). In addition, the company had short-term loans from banks (UAH 5,9 thousand), which indicates dependence on external sources of financing to cover operating needs. Liabilities for settlements with the budget (UAH 3,3 thousand) and income tax (UAH 3,3 thousand) also occurred but did not have a significant impact on the total amount of liabilities. In 2020, current liabilities increased significantly to UAH 344 thousand, mainly due to an increase in liabilities for goods to UAH 114 thousand and other current liabilities to UAH 229 thousand. The decrease in short-term bank loans to UAH 0 thousand indicates the refusal to use bank loans in the short term.

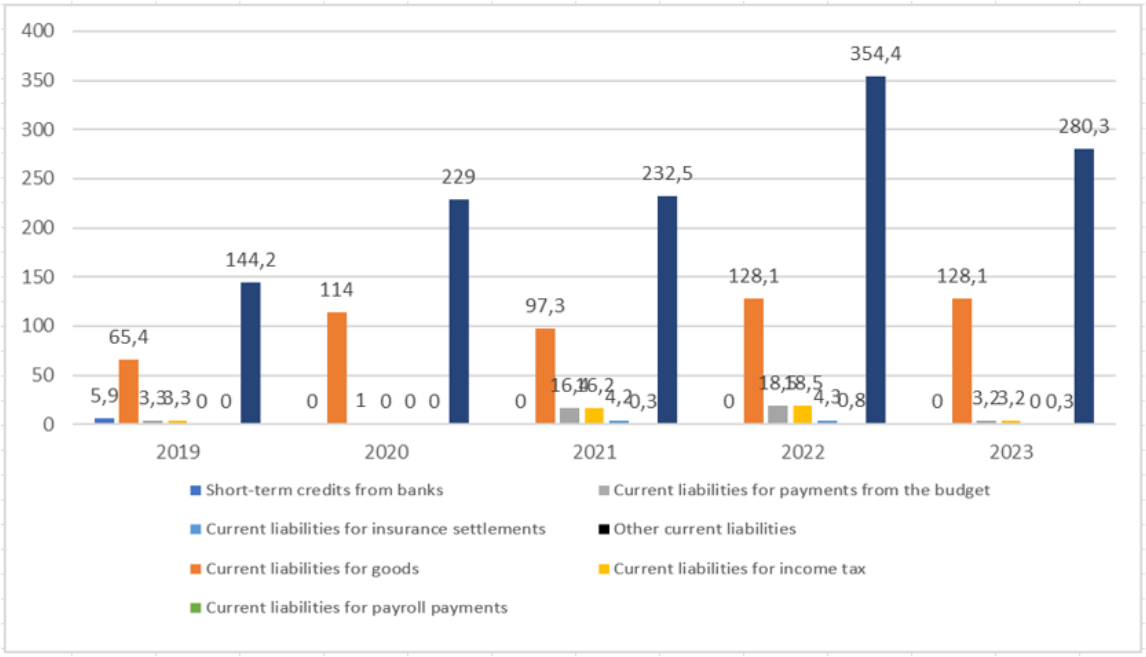


Figure 2.9 – Dynamics of the structure of the company's current liabilities

Source: made by the author

In 2021, total current liabilities increased to UAH 350,7 thousand, again due to an increase in other current liabilities to UAH 232,5 thousand. Liabilities for goods decreased slightly to UAH 97,3 thousand, but liabilities for settlements with the budget (UAH 16,4 thousand) and income tax (UAH 16,2 thousand) increased significantly. There were also liabilities for insurance (UAH 4,2 thousand) and payroll (UAH 0,3 thousand), which indicates an increase in the company's social and tax liabilities. In 2022, current liabilities peaked at UAH 506,1 thousand. The main factor behind this increase was a significant increase in other current liabilities to UAH 354,4 thousand, which may indicate the accumulation of debts to various counterparties. Liabilities for goods also increased to UAH 128,1 thousand, and liabilities for settlements with the budget and income tax amounted to UAH 18,5 thousand each. Liabilities for insurance and payroll continued to grow to UAH 4,3 thousand and UAH 0,8 thousand, respectively.

In 2023, the total amount of current liabilities decreased to UAH 411,9 thousand, which may indicate certain efforts of the company to reduce the debt burden. Other current liabilities decreased to UAH 280,3 thousand, which is a positive sign. Liabilities for goods remained at the level of UAH 128,1 thousand, while liabilities for

settlements with the budget and income tax decreased significantly to UAH 3,2 thousand each. Insurance liabilities decreased to UAH 0 thousand, and payroll liabilities slightly decreased to UAH 0,3 thousand. These changes indicate a reduction in the financial burden and better control over financial liabilities, which may have a positive impact on the overall financial stability of the company.

Thus, the overall financial condition of «Cargo Logistic Service Ukraine» during the analyzed period demonstrates both positive and negative trends. Despite the growth of current assets in some years, the overall instability of equity and a significant level of current liabilities indicate financial difficulties. Negative equity is the main problem that needs to be addressed, as it indicates accumulated losses or insufficient own resources to cover liabilities. The reduction in current liabilities in 2023 can be seen as a step toward stabilization, but further efforts should be directed at increasing equity and improving liquidity. Investments in long-term assets could contribute to more stable growth and reduce dependence on short-term liabilities.

Next, let us analyze the company's income statement.

Table 2.2 – Analysis of the income statement of «Cargo Logistic Service Ukraine» LLC for 2019-2023 (UAH thousand)

Indicator	2019	2020	2021	2022	2023	Deviation 2023 / 2022	
						thousand UAH	%
1	2	3	4	5	6	7	8
Net income (revenue) from sales	321	35,8	988,2	624,9	160,2	-464,7	-74,36%
Cost of goods sold	187,8	15,5	837,2	497	65	-432	-86,92%
Other operating income	0	4	0	43	7,5	-35,5	-82,56%
Total income	321	39,8	988,2	667,9	167,7		
Other operating expenses	115	153,1	61,1	68,1	85	16,9	24,82%
Financial results before taxation	18,2	-128,8	89,9	102,8	17,7	-85,1	-82,78%
Income tax expense	3,3	0	16,2	18,5	3,2	-15,3	-82,70%

The end of the Table 2.2

1	2	3	4	5	6	7	8
Net profit	14,9	-128,8	73,7	84,3	14,5	-69,8	-82,80%
Total expenses	302,8	168,6	898,3	565,1	150	-415,1	-73,46%

Source: made by the author based on the financial statements and [14,15,16]

The analysis of the financial results of «Cargo Logistic Service Ukraine» LLC for 2019-2023 shows significant fluctuations in income and expenses, primarily in cost (Fig. 2.10).

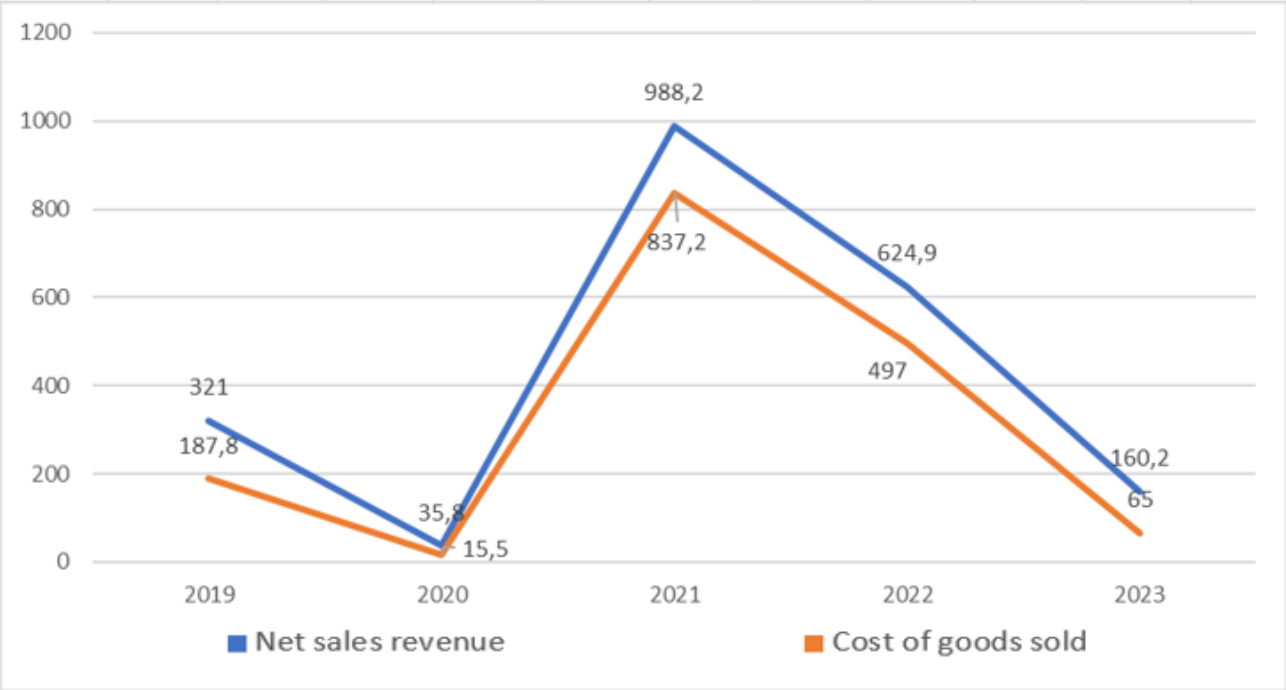


Figure 2.10 – Dynamics of revenue and cost of sales

Source: made by the author

In 2019, net revenue from sales amounted to UAH 321 thousand, and cost of sales amounted to UAH 187,8 thousand, which provided the company with a net profit of UAH 14,9 thousand. However, in 2020, there was a sharp decline in net income to UAH 35,8 thousand, while the cost of goods sold decreased to UAH 15,5 thousand. As a result, the company suffered a loss before tax of UAH -128,8 thousand. In 2021, the company was able to significantly increase its revenues to UAH 988,2 thousand, which

indicates a significant improvement in operating activities. At the same time, the cost of goods sold increased to UAH 837,2 thousand, resulting in a profit before tax of UAH 89,9 thousand.

In 2022, net income decreased to UAH 624,9 thousand, and cost of goods sold decreased to UAH 497 thousand, which provided the company with a profit before tax of UAH 102,8 thousand. However, in 2023, the company again experienced a significant decrease in net income to UAH 160,2 thousand, which is 74,36% less than in 2022. The cost of goods sold also significantly decreased to UAH 65 thousand, which is a decrease of 86,92%. As a result, the financial result before tax amounted to only UAH 17,7 thousand, which is 82,78% less than in the previous year.

The company also received other operating income, which was absent in 2019 and 2021, but amounted to UAH 4 thousand in 2020, UAH 43 thousand in 2022, and UAH 7,5 thousand in 2023. The largest amount of other operating income was in 2022, which indicates the presence of additional sources of income in that year. However, in 2023, this figure decreased by 82,56% to UAH 7,5 thousand.

It is also interesting to study the cost structure of the company (Fig. 2.11).

The analysis of the cost structure of «Cargo Logistic Service Ukraine» LLC for the period from 2019 to 2023 reveals significant changes in the distribution of cost and other operating expenses. In 2019, the majority of expenses were the cost of goods sold, which amounted to 62,02%, while other operating expenses amounted to 37,98%. This indicates a significant share of direct costs associated with the production and sale of products. At the same time, other operating expenses underwent significant changes during the analyzed period. In 2019, they amounted to UAH 115 thousand, in 2020 they increased to UAH 153,1 thousand, which is a significant increase. In 2021, other operating expenses decreased to UAH 61,1 thousand, but in 2022 they increased again to UAH 68,1 thousand. In 2023, this figure increased to UAH 85 thousand, which is 24,82% more than in the previous year.

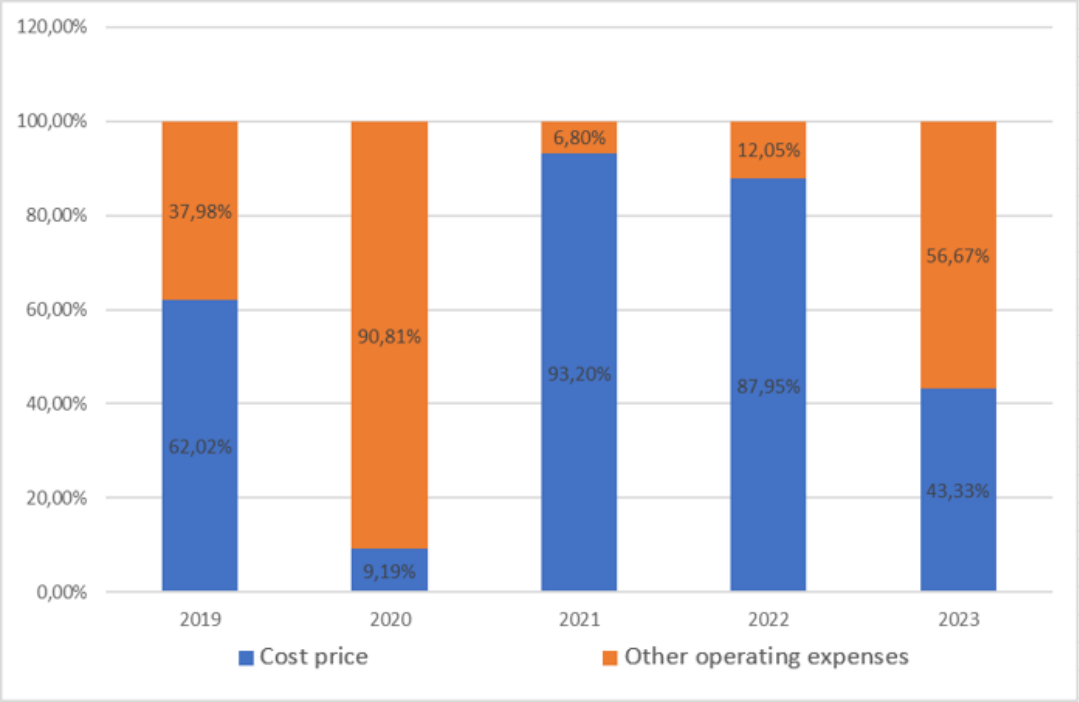


Figure 2.11 – Dynamics of revenue and cost of sales

Source: made by the author

In general, the analysis of the cost structure of «Cargo Logistic Service Ukraine» for the period 2019-2023 shows significant fluctuations in the distribution between cost and other operating expenses. In some years (e.g., 2021), the cost of production accounted for the majority of expenses, indicating efficient operations with low indirect costs. In other years (e.g., 2020 and 2023), the cost structure was significantly shifted towards other operating expenses, which may indicate problems in the company's management or external factors that affected financial stability.

The financial result before taxation during the analyzed period shows significant fluctuations. In 2019, the company received UAH 18,2 thousand of profit before tax, in 2020 it suffered losses of UAH -128,8 thousand, in 2021 this figure improved to UAH 89,9 thousand, and in 2022 it increased to UAH 102,8 thousand. However, in 2023, profit before tax decreased to UAH 17,7 thousand, which indicates a deterioration in the company's financial condition. Income tax in 2019 amounted to UAH 3,3 thousand, in 2020 this figure was absent, in 2021 it increased to UAH 16,2 thousand, and in 2022 it reached UAH 18,5 thousand. In 2023, income tax decreased

to UAH 3,2 thousand, which is 82,70% less than in the previous year.

Finally, let's look at the dynamics of the company's profit (Fig. 2.12).

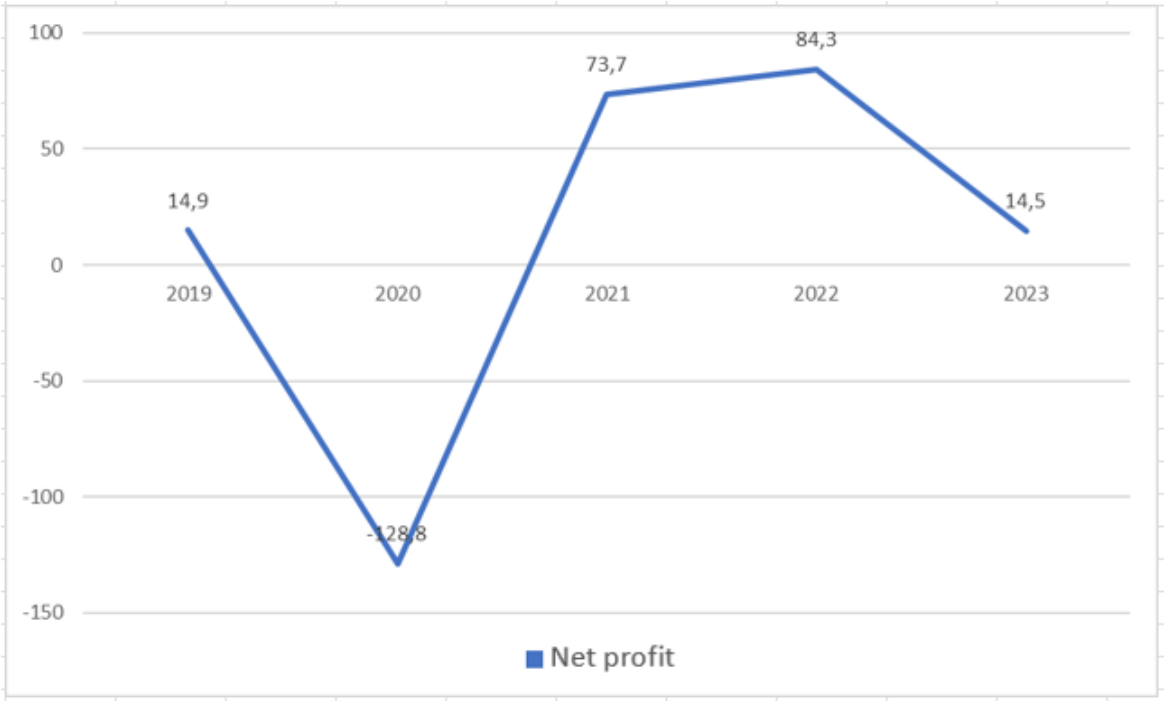


Figure 2.12 – Dynamics of net profit

Source: made by the author

The company's net profit in 2019 amounted to UAH 14,9 thousand, in 2020 the company incurred losses of UAH -128,8 thousand, in 2021 net profit amounted to UAH 73,7 thousand, and in 2022 it increased to UAH 84,3 thousand. In 2023, net profit decreased to UAH 14,5 thousand, which is 82,80% less than in the previous year. This decline indicates significant difficulties in the company's financial activities.

Next, we calculate the financial stability indicators that characterize the company's capital (Table 2.3).

The financial independence (or autonomy) ratio shows the share of equity in the total structure of the company's assets, which allows us to assess its ability to function independently of external sources of funding. In 2019, this indicator amounted to 10,22%, which indicated a certain dependence on external borrowings, but within the permissible limits. In 2020, the indicator dropped sharply to -129,33%, indicating a critical situation when debts significantly exceeded equity. In 2021, there was an

improvement to -52,41%, although the indicator remained negative, indicating significant financial instability. In 2022, the ratio improved to -9,38%, and in 2023 to -7,52%, indicating a gradual decrease in negative dependence on external financing. A positive change of 1,86% compared to 2022 shows that the company is slowly moving towards financial stability, although it has not yet reached positive values.

Table 2.3 – Dynamics of financial stability indicators of «Cargo Logistic Service Ukraine» LLC for 2019-2023

Indicator	2019	2020	2021	2022	2023	2023 / 2022
1	2	3	4	5	6	7
Financial dependence ratio	978,71%	-77,32%	-190,80%	-1066,13%	-1330,21%	-264,08%
Debt ratio	878,71%	229,33%	-290,80%	-1166,13%	-1430,21%	-264,08%

Source: made by the author

The financial dependency ratio shows how much a company depends on external financing. In 2019, this indicator was 978,71%, indicating a very high dependence on debt. In 2020, there was a decrease to -77,32%, indicating a critical situation with financial dependence, where debts exceeded equity. In 2021, the indicator increased to -190,80%, which demonstrates a further increase in dependence.

The debt ratio shows the ratio of total liabilities to equity. In 2019, this indicator was 878,71%, which indicates a very high debt burden. In 2023, the situation deteriorated even further to -1430,21%. The increase of -264,08% compared to 2022 shows that the company has incurred even more debt, and urgent measures are needed to reduce the debt burden and improve the financial structure.

Next, let’s examine the company’s profitability.

Table 2.4 – Dynamics of profitability indicators of «Cargo Logistic Service Ukraine» LLC for 2019-2023

Indicator	2019	2020	2021	2022	2023	2023 / 2022
1	2	3	4	5	6	7
Return on assets	6,11%	-85,87%	32,03%	18,22%	3,78%	-14,40%
Return on equity	59,84%	66,39%	-61,11%	-194,24%	-50,35%	143,90%
Return on sales	4,64%	-359,78%	7,46%	13,49%	9,05%	-4,40%
Return on current assets	6,11%	-85,87%	32,03%	18,22%	3,78%	-14,40%

Source: made by the author

Return on assets shows how efficiently a company uses its assets to generate profit. In 2019, this indicator was 6,11%, which indicates a positive impact of assets on profit generation. However, in 2020, there was a significant drop to -85,87%, indicating serious problems in asset utilization, possibly due to losses or inefficient investments. In 2021, the return on assets rises sharply to 32,03%, demonstrating an improvement in financial condition and efficiency. However, in 2022, the indicator decreases to 18,22%, and in 2023 to 3,78%. This indicates a decline in the efficiency of asset utilization compared to previous years, and a 14,4% decrease compared to 2022 indicates the need to optimize asset management.

Return on equity reflects the company's profitability relative to investors' own funds. In 2019, the indicator was very high - 59,84%, which indicates high efficiency of equity use. In 2020, the indicator increased significantly to 66,39%, despite negative financial results, which indicates possible high operating costs. In 2021, the return on equity decreased to -61,11%, indicating a loss. In 2022, the figure becomes even worse -194,24%, which may be due to significant losses. In 2023, the situation improves slightly to -50,35%, but still remains negative. An increase of 143,9% compared to 2022 indicates some improvement but return on equity remains a problem area.

Return on sales shows the percentage of profit per unit of revenue. In 2019, this indicator was 4,64%, which is a fairly good value. In 2020, the profitability drops sharply to -359,78%, which indicates significant losses or high expenses relative to income. In 2021, the figure rises to 7,46%, indicating an improvement in profitability. In 2022, the return on sales increases to 13,49%, showing significant progress. However, in 2023, the indicator decreases to 9,05%, which is still positive, but 4,4% lower than in 2022, indicating the need to control costs and improve operational efficiency.

Return on current assets is similar to return on assets, showing the efficiency of using current assets to generate profit. Return on current assets coincides with return on assets, indicating similar trends in the efficiency of current assets. In 2019, this indicator was 6,11%, in 2020 it dropped significantly to -85,87%, in 2021 it rose to 32,03%, in 2022 it dropped to 18,22%, and in 2023 to 3,78%. The 14,4% decrease compared to 2022 highlights problems with the efficiency of current asset management.

Let us conclude the analysis by calculating liquidity and business activity indicators.

Table 2.5 – Analysis of liquidity and business activity indicators of «Cargo Logistic Service Ukraine» LLC for 2019-2023

Indicator	2019	2020	2021	2022	2023	2023 / 2022
1	2	3	4	5	6	7
Current liquidity ratio	1,114	0,436	0,656	0,914	0,930	0,016
Quick liquidity ratio	1,114	0,436	0,656	0,633	0,585	-0,048
Absolute liquidity ratio	-	-	0,056	0,145	0,003	-0,143
Asset turnover	1,317	0,239	4,295	1,351	0,418	-0,932
Receivables turnover	4,079	0,628	12,291	9,468	2,743	-6,725

Source: made by the author

The current ratio reflects the company's ability to cover its short-term liabilities with current assets. In 2019, the ratio was 1,114, which is a sufficient level of liquidity. In 2020, there was a significant decline to 0,436, indicating financial difficulties. In subsequent years, the ratio gradually improved, reaching 0,930 in 2023, indicating

stabilization, although the value has not yet reached the optimal level (greater than 1).

The quick ratio measures the company's ability to cover short-term liabilities without taking into account inventory. The value of this ratio in 2019 was 1,114, which is sufficient. In 2020, the ratio dropped to 0,436, indicating liquidity problems. Despite some improvement in 2021-2022, in 2023 the ratio dropped again to 0,585, indicating unresolved financial problems.

The absolute liquidity ratio reflects the company's ability to cover its liabilities with its most liquid assets. In 2021, this indicator was 0,056, improving to 0.145 in 2022. However, in 2023, the ratio plummeted to 0,003, indicating a critical level of liquidity and an urgent need to improve cash management.

Asset turnover shows how efficiently a company uses its assets to generate revenue. In 2019, this indicator was 1,317, but fell to 0,239 in 2020. In 2021, the company showed a significant improvement to 4,295, but in 2022, this indicator dropped to 1,351, and in 2023, it fell to 0,418, indicating a decrease in asset utilization efficiency.

Accounts receivable turnover reflects the speed of repayment of receivables. In 2019, this indicator was 4,079, but dropped to 0,628 in 2020, indicating problems with the collection of receivables. In 2021, the indicator rose to 12,291, demonstrating effective debt management, but in 2022 it dropped to 9,468, and in 2023 to 2,743, indicating a significant deterioration in receivables management.

Summarizing the analysis, we can say that the company has a rather unstable financial condition and profitability due to the Covid crisis and political problems in the country. But the state of the company is starting to recover over time, adjusting to today's realities.

2.3 Analysis of the organization of business processes in the air transport supply chain of the «Cargo Logistic Service Ukraine» LLC

Air freight is a vital part of global economic activity, despite the fact that ocean freight is the dominant mode of transportation by volume. Air freight is much faster and is used for goods that need to get to market quickly or require special conditions for transportation, such as fresh food, medical supplies and sensitive equipment.

An air freight forwarding company delivers a shipment through a careful process that involves several steps, from initial planning and preparation to final delivery of the goods. This process is designed to ensure safe, efficient and timely transportation of cargo by air, meeting the diverse needs of shippers and consignees around the world.

Before the start of the full-scale military aggression, the strategic center of activity of «Cargo Logistic Service Ukraine» was Kyiv International Airport (Zhuliany). A distinctive feature of Zhuliany was its unique logistics structure, where warehouse and cargo terminals were integrated into private ownership, unlike the state infrastructure of Boryspil Airport, where the processes of interaction and signing of contracts were often longer and more complicated. Airlines operating from Zhuliany covered approximately 80% of the key routes with which the company cooperated. Due to the compact size of the airport, the procedure for accepting cargo and loading it on board the aircraft took no more than two hours. From the moment of customs clearance to departure, it took only an hour and a half to successfully transfer the cargo to the terminal without the need for additional storage or transportation stages. Goods with special storage conditions or limited delivery times were handled extremely quickly and efficiently. Thus, the company could deliver cargo from Kyiv to the United States, for example, in less than 24 hours.

Unfortunately, over time, conditions have changed, and the process of delivering cargo by air from Ukraine has become much more complex, including elements of road transport and turning into a multimodal system. Due to the closed sky, goods began to be transported by road across the Ukrainian border to other international airports. As a result, the airlines that used to operate at Zhuliany Airport have made it possible to book their flights from airports located near Ukraine. At the moment, the main transit hubs are Fryderyk Chopin Airport in Warsaw or Chisinau International Airport. Warsaw Airport provides access to almost 100% of the necessary destinations, while

Chisinau offers a more convenient location and simplified border crossing procedures, although the airline network there is somewhat smaller, meeting 80% of the needs.

These changes have led to a significant increase in cost and slower delivery times. Now, shipments from Ukraine take 7 to 10 days to arrive, as it is necessary to accept the cargo, check its readiness for air transportation, find suitable road transport, deliver it to the departure airport, go through control procedures, book the flight and wait for it to depart, which sometimes does not happen every day and takes a lot of time. In addition, problems at the border sometimes led to delays in the transfer of cargo at the airport of departure, which further increased the delivery time by several days.

Let's take a look at the whole process of cargo delivery carried out by «Cargo Logistic Service Ukraine». This process is initiated by a shipper who decides to transport goods by air. He contacts the air freight forwarding service to discuss the specifications and requirements for transportation. The application can be submitted in the form of a standard letter or through a specialized form, where you need to provide information about the shipper and consignee, a detailed description of the cargo, the number and size of pieces, type of packaging, the need for additional services, the delivery deadline and the time the cargo is ready for transportation. This data is used to select the optimal level of air transportation service, which can range from express options for urgent shipments to more affordable options for less urgent deliveries.

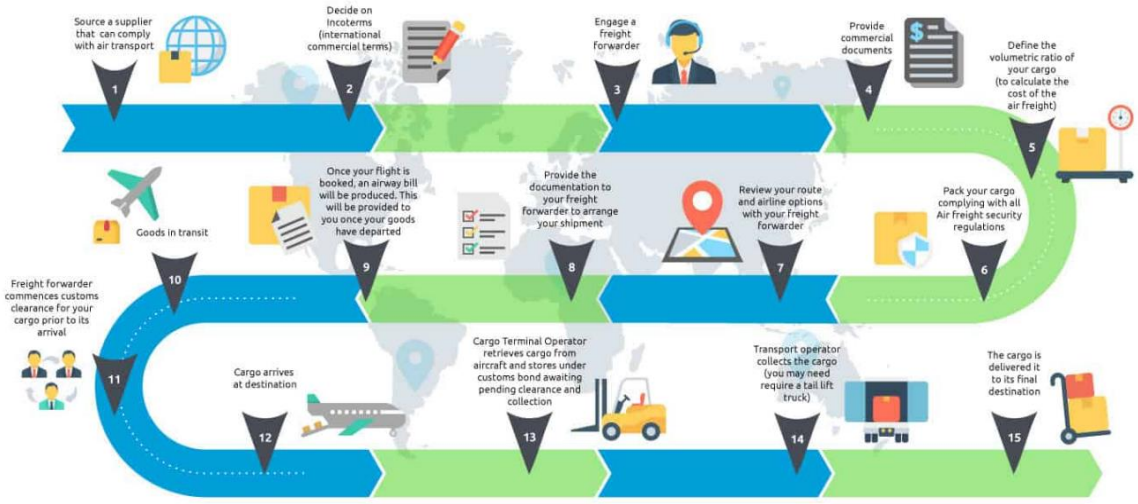


Figure 2.13 - Air freight process

Source: [34]

After that, the company starts analyzing possible routes, determines the cost, and forms a route that is subsequently offered to the shipper. If the consignor agrees, the air transportation booking is confirmed and coordination with airlines begins.

The key factors in choosing a route are delivery time, the number of transit points, and the possibility of a direct flight. Transit routes carry risks of delays, loss or damage to the cargo, and increase the overall transportation time.

On the airline's website, a carrier is selected with which «Cargo Logistic Service Ukraine» has contracts, such as «LOT Polish Airlines» or «SkyUp», and the date when the cargo will be ready for shipment is determined. The company checks the availability of flights and their details, including the flight number, departure time, and type of aircraft. After agreeing on all the details with the carrier, the airline provides a tariff schedule (Fig. 1.6). Depending on the type of cargo and its final destination, the appropriate tariff is determined. At the final stage, a commercial offer is formed and sent to the airline for further flight booking.

UIACARGO
Ukraine International Airlines

Тарифи на перевезення генеральних та спеціальних вантажів з України до міст світу

Тарифи наведені в доларах США без ПДВ (нараховується згідно чинного законодавства України, 20% на рейсах всередині України).

Процентна надбавка від генерального тарифу для спеціальних вантажів

PER - 10% DIP/MUW/VUN - 15% TDS/OHG - 50%

											ex KBP only					
											Dangerous Goods		Human Reamain		Valuable cargo	
TO CITY	CODE	MIN	N	+45	+100	+250	+500	+1000	VIA	Second C	MIN	N	MIN	N	MIN	N
AMSTERDAM	AMS	60,00	2,30	1,55	1,40	1,30	1,25	1,20	DIRECT	DIRECT	80,00	2,95	200,00	8,00	200,00	8,00
BAKU	GYD	80,00	2,35	2,30	2,00	1,80	1,60	1,50	DIRECT	DIRECT	75,00	3,10	200,00	6,00	200,00	8,00
BARCELONA	BCN	90,00	2,80	2,05	1,30	1,20	1,15	1,10	DIRECT	DIRECT	120,00	2,95	200,00	10,00	200,00	10,00
BERLIN	BER	65,00	2,00	1,60	1,25	1,15	1,05	1,00	DIRECT	DIRECT	80,00	2,50	200,00	7,00	200,00	7,00
CAIRO	CAI	60,00	2,00	1,35	1,20	1,15	1,10	1,05	DIRECT	DIRECT	XXX	XXX	200,00	5,00	200,00	5,00
CHISINAU	KIV	60,00	2,05	1,90	1,70	1,55	1,50	1,45	DIRECT	DIRECT	70,00	3,50	200,00	5,00	200,00	5,00
DELHI	DEL	90,00	2,80	2,20	2,00	1,55	1,40	1,30	DIRECT	DIRECT	110,00	3,00	200,00	6,00	200,00	10,00
DUBAI	DXB	85,00	2,15	1,90	1,25	1,15	1,10	1,10	DIRECT	DIRECT	100,00	2,65	200,00	6,00	200,00	9,00
GENEVA	GVA	80,00	2,30	2,00	1,65	1,30	1,25	1,20	DIRECT	DIRECT	100,00	3,25	200,00	7,00	200,00	8,00
ISTANBUL(same ex ODS)	IST	80,00	2,40	2,25	1,50	1,20	1,10	1,05	DIRECT	DIRECT	90,00	2,70	200,00	5,00	200,00	9,00

Figure 2.14 - An example of an air cargo tariff schedule of an air carrier

Source: made by the author

The process of booking cargo for air transportation is a key step in the logistics chain, which begins with submitting a request for transportation to the selected airline. This request includes all the necessary details and specifications of the cargo, which

allows the airline to prepare the appropriate resources for its transportation.

After filling out the request, the company sends an official telegram to the airline to confirm its intentions for transportation. The response from the airline confirming the acceptance of the request is a signal to us that we can start preparing the cargo for shipment.

The forwarding service prepares all the necessary documentation, including an air waybill (AWB), which is an official document certifying the contract between the shipper and the carrier airline and a CMR for road transportation. The AWB contains comprehensive information about the cargo, including the identification data of the shipper and the consignee, a detailed description of the cargo, its weight and dimensions. To create and edit AWBs, the company uses specialized software called «AWB Editor», which allows for efficient generation and tracking of waybills, ensuring the accuracy and correctness of the data in the documentation.

The shipper also prepares additional documents, such as a commercial invoice, packing list, certificate of origin, and, in the case of dangerous goods, a dangerous goods declaration. For an additional charge, the freight forwarder can assist in customs clearance, ensuring the accuracy and completeness of all required documents, including commercial invoices and packing lists, which is critical to avoid any delays or problems with customs authorities during the transportation of the cargo.

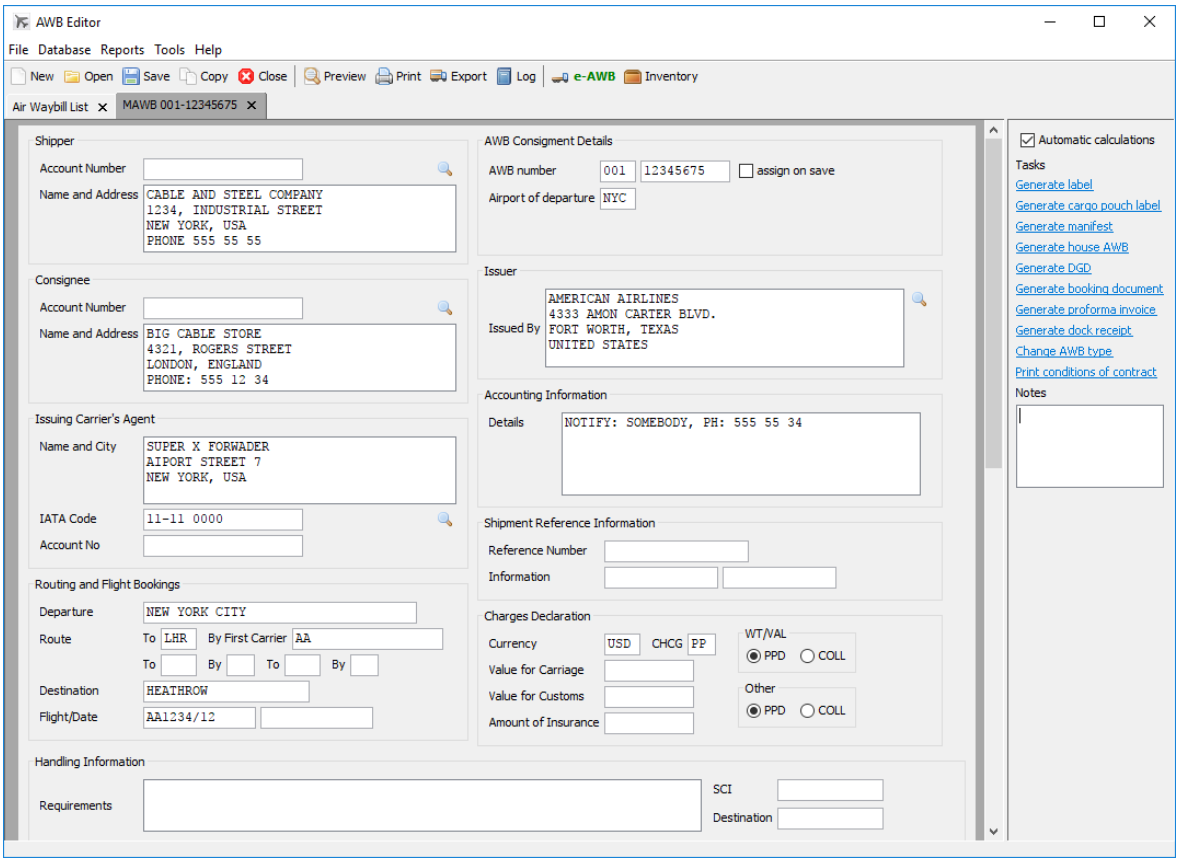


Figure 2.15 - Interface of the «AWB Editor» program

Source: [21]

Once the documentation is in proper order, «Cargo Logistic Service Ukraine» organizes the pickup of the cargo from the shipper's location. Then the cargo is transported to a warehouse, where it is consolidated with other cargoes heading to the same destination. This consolidation process helps to optimize air cargo capacity, reduce costs and increase efficiency.

Experienced packing agents carefully pack goods using standardized materials to ensure they are properly protected during transportation. Proper packaging is essential to prevent damage and comply with airline safety regulations. Safety is of primary importance in air cargo transportation. To ensure the safety of cargo and compliance with aviation safety rules, the freight forwarding company organizes the passage of various security checks for the cargo. This includes X-ray scanning and physical inspection and other security measures. The company works closely with the

relevant authorities and the airline to facilitate the inspection process and minimize delays.

The company then has contracts and connections with road carriers. Therefore, the cargo is first shipped by road across the Ukrainian border to the nearest airport. Before the cargo is loaded onto an airplane, it must go through customs clearance in the country of departure. The company's freight forwarder prepares and submits the necessary documents, such as a commercial invoice, packing list, and any other required certificates, to the customs authorities. Then the cargo is checked, and if everything is in order, it receives an export permit.

After receiving the customs clearance, the freight forwarder delivers the cargo to the airport. This can be done by truck or any other suitable mode of transportation. The expediter ensures that the cargo arrives at the airport long before the flight departs in time to pass security checks and be loaded.

At the airport, the cargo is checked for security to ensure that it doesn't contain any prohibited items. After the check, the cargo is loaded onto the plane. The freight forwarder coordinates with the airline to ensure that the package is loaded onto the correct flight and that it is handled with care. Throughout the journey, they monitor the flight to make sure it departs and arrives on time. It also monitors any delays or changes in the flight schedule. This is done using the «Flight Radar» software or on the airline's website using the AWB number.

LOT Track & Trace

Shipment History Details

AWB Number	Part #	Status	Flight	Date	Destination
080-37310420	1	Delivered to consignee		02MAY 23:54	WAW

Status History - Part 1 of Shipment 080-37310420	Date
1 piece at 1.5 kilos **delivered** at 2354 hrs on 02MAY at Warszawa (Warsaw), Poland	02MAY 23:54
1 piece at 1.5 kilos **documents delivered** at 2354 hrs on 02MAY at Warszawa (Warsaw), Poland	02MAY 23:54
1 piece at 1.5 kilos **informed of arrival** at 1302 hrs on 02MAY at Warszawa (Warsaw), Poland	02MAY 13:02
1 piece at 1.5 kilos **received on flight** LO286 at 1120 on 02MAY at Warszawa (Warsaw), Poland	02MAY 11:20
1 piece at 1.5 kilos **received on flight** LO286 at 1120 on 02MAY at Warszawa (Warsaw), Poland	02MAY 11:20
1 piece at 1.5 kilos **arrived on flight** LO286 at 1120 on 02MAY at Warszawa (Warsaw), Poland actual departure time 1120 hrs actual arrival time 1120 hrs	02MAY
1 piece at 1.5 kilos **received on flight** LO286 at 1113 on 02MAY at Warszawa (Warsaw), Poland	02MAY 11:13
1 piece at 1.5 kilos **departed** on flight LO286 on 02MAY from London, England, United Kingdom to Warszawa (Warsaw), Poland	02MAY
1 piece at 1.5 kilos **departed** on flight LO286 on 02MAY from London, England, United Kingdom to Warszawa (Warsaw), Poland	02MAY

Figure 2.16 - Example of cargo tracking on the airline's LOT website

Source: [40]

Upon arrival at the destination airport, the cargo is promptly unloaded from the aircraft by ground handling personnel. Particular attention is paid to ensuring timely removal of cargo and its transfer to the airport's cargo handling facilities. As at the point of departure, the cargo undergoes customs clearance at the destination airport. The air freight forwarding company «Cargo Logistic Service Ukraine» contacts the local customs authorities to facilitate the smooth passage of customs clearance, paying all necessary duties and taxes on behalf of the client.

Finally, to complete customs clearance, the cargo is transported from the airport to the final destination. This may involve using the company's distribution network or engaging local transportation partners for the last mile delivery. We make every effort to ensure timely and safe delivery of goods to the customer's doorstep.

2.4 Safety and security issues of cargo logistics in the company's operations

As mentioned earlier «Cargo Logistic Service Ukraine» is an air freight forwarding company. Freight forwarders and logistics service providers play a key role in the supply chain. The main task of a freight forwarder, who is a participant in the transportation and logistics process, is to carefully prepare and deliver cargo to the aircraft operator. These functions may include consolidation of cargo. Freight forwarders also provide cargo preparation, warehousing, transportation and final delivery services, including documentation and facilitation. Freight forwarders don't usually act as carriers. Instead, they organize multi-stage transportation of goods by different modes of transport, forming a delivery chain [4].

The cargo supply chain is a complex and multifaceted system in which risk can arise at any of its stages. Air cargo transportation typically involves the transportation of goods of higher value and value than other modes of transportation by land or sea. Consequently, these shipments must always be carefully screened and become highly

vulnerable to tampering, theft and other illegal activities. Air transportation faces security risks, especially at critical times such as loading and unloading, storage at warehousing facilities, and during transit to and from airports.

Entities in the transportation chain that handle general cargo play an important role in preventing risks from occurring and reducing them to an acceptable level of security. Every organization involved in the transportation process has the opportunity to apply an effective mitigation and risk minimization strategy.

Despite the strict rules and regulations governing air transportation, «Cargo Logistic Service Ukraine» must adhere to high security standards and take extra measures to ensure the safety and integrity of its cargo. The company's security screening process is therefore carried out as follows.

When a booking request is received, the company carefully checks the booking details, including the nature of the shipment, its value and any special handling requirements. This initial step helps identify potential risks and ensures that the company is prepared to handle the specific shipment. Prior to acceptance, a thorough physical inspection is conducted to assess the condition of the shipment, packing adequacy and compliance with transportation regulations. This inspection helps identify any potential damage or non-compliance issues that could jeopardize the safety of the shipment during transit.

Accurate and complete documentation is critical to tracking and identifying the shipment throughout its journey. Properly completed shipping documents, including air waybills, packing lists and customs declarations, serve as the foundation for secure shipments. Having correct documentation ensures that there are no discrepancies between the goods shipped and their paper description, reducing the likelihood of miscommunication, delays and mishandling due to inaccurate information. In addition, proper labeling with clear indication of the shipment, its destination and handling instructions is essential to prevent misrouting or mishandling.

Strong packaging is another important protection against unauthorized access, theft and damage. Materials that prevent unauthorized access and tampering, such as tamper-resistant seals and secure locking mechanisms, are critical to preventing cargo

from being tampered with. In addition to deterring malicious intent, proper packaging also protects goods from the difficulties of transportation by reducing the likelihood of damage caused by careless handling or adverse weather conditions. Effective storage methods in shipping containers ensure that cargo remains stable and protected throughout its journey. «Cargo Logistic Service Ukraine» ensures that the shipment is properly packaged to withstand the rigors of air transportation. This may include the use of appropriate packaging materials such as reinforced boxes, pallets or special containers, depending on the nature of the goods.

Covering a wide range of services related to the delivery of goods, KARGO carries certain risks that can lead to significant financial losses, property damage, delivery delays and other negative consequences. To effectively manage risks and ensure the safe and smooth operation of a forwarding company, a thorough assessment of potential threats and the development of effective prevention measures are required. As shown in the risk matrix below, no stage of the journey is completely safe.

In the digital age, the ability to monitor and track shipments in real time is a game changer for cargo security. The combination of technologies such as shipment tracking through specialized applications provides «Cargo Logistic Service Ukraine» with unprecedented visibility into the location, conditions and status of a shipment. This real-time tracking enhances security by enabling rapid response to anomalies and provides transparency to stakeholders at every stage of the supply chain. Increased transparency helps to create an atmosphere of accountability and deter potential threats.

2.5 Chapter 2 summary

The analytical section was devoted to the general diagnostics of logistics of «Cargo Logistic Service Ukraine». The company's activity consists in providing freight forwarding services, specializing in international air cargo transportation. Today the company has changed the process of delivery of goods from Ukraine by integrating

road transportation, thus transforming into a multimodal system of transportation, which, in turn, helped to stay in the market and not lose customers. The distinctive feature of the company is its ability to provide personalized solutions, ensure the highest level of service and offer a full range of logistics services. These services cover all aspects of the logistics chain: from direct deliveries to integrated cargo management, including international multimodal transportation, customs declaration, warehousing, packaging and final delivery.

The financial condition of the company should be considered in the context of political problems and general instability. Despite some financial risks associated with low profitability and low financial stability indicators, in general the company is more or less financially stable. The analysis showed that various typical problems may arise in the processing of air transportation, such as delays, improper packing of goods, customs and regulatory issues, as well as security risks.

In order to develop and minimize all possible risks in aviation services, it is recommended that the company implement a security management system. This will protect aviation from acts of unlawful interference by combining both human and material resources.

CHAPTER 3
CREATION OF A SECURITY DEPARTMENT IN «CARGO LOGISTIC SERVICE UKRAINE» LLC

3.1 Safety and security challenges at «Cargo Logistic Service Ukraine» LLC

Security has become one of the most pressing issues for many organizations. It is a very important requirement for doing business in the global networked economy and for achieving the organization's purpose and mission. But it is not an easy task. The technical and environmental complexity of today's organizations and the constantly increasing reliance on technology to manage and automate processes and create competitive advantage, make security a challenging activity. Adding to this complexity is the growing list of threats vulnerabilities, complex threats to which the organization is exposed on a daily basis. Increased competition, war, and instability in the aviation market are just some of the factors that affect the efficiency of forwarding companies [38].

Human error remains a significant factor in cargo security incidents in a company. Inaccurate or incomplete documentation can lead to misidentification, misrouting, or delays in cargo clearance. Since the company has a small number of people staff, overworked staff may miss important details when checking booking information. Also, important details such as fragile items packed haphazardly, leaking liquids, or mislabeling may be missed during rush checks, which can lead to mishandling. This can lead to damage, loss or safety issues. To minimize these risks, strict adherence to documentation standards, thorough data verification comprehensive training, clear procedures and effective controls are essential.

«Cargo Logistic Service Ukraine» also has weak access controls. Lack of monitoring or outdated security protocols can create vulnerabilities that make

unauthorized access or cargo theft possible. To address these vulnerabilities, video monitoring systems, access controls, and security checkpoints are being implemented for thorough searches. This will help detect hidden items and prevent contraband, which play an important role in protecting against the risks and liability associated with transporting compromised or dangerous goods. There also needs to be regular security assessments, system upgrades and ongoing training for security personnel are critical to maintaining robust security measures.

It can be difficult for small companies to provide comprehensive security training for all personnel. Insufficient training leads to unfamiliarity with security protocols and an increased risk of inspection error.

Security procedures are not reviewed or updated regularly to reflect changing regulations or industry best practices, leaving the company vulnerable to new security threats or risks.

Finally, the company should look at providing the necessary equipment to load, unload and safely handle cargo. The equipment is in good condition, but it is advisable to regularly inspect and maintain it to ensure that it is functioning properly and complies with security standards [23].

Transportation of goods by air involves a significant level of risk at all stages of the company's operations. Although moving goods from one place to another seems simple, there are many opportunities for criminals to attack or steal cargo.

The Table 3.1 shows an assessment of possible security risks in an air freight forwarding company at different stages of the logistics process. The frequency of risks is assessed on a scale from 1 to 5, where 1 is the lowest probability and 5 is the highest probability.

Table 3.1 – Threat/Risk matrix on transportation process

Threat \ Risk	Cargo loading	Cargo storage	Cargo transportation	Cargo unloading	Documentary processing
Terrorist threat	3	2	4	3	2

The end of the Table 3.1

Smuggling	4	3	3	4	2
Theft	3	4	2	3	3
Damage to cargo	3	3	4	3	2
Document forgery	2	2	3	2	4
Illegal access to cargo	4	3	2	4	3
Negligence of staff	3	3	3	3	3
Non-compliance with regulatory requirements	2	2	2	2	3

Source: made by the author

The threat of terrorism in the organization of air cargo transport has different levels of risk at different stages. At the stage of loading cargo that is potentially vulnerable to the potential hiding of potentially explosive substances or other dangerous items, the score is 3. In the storage of cargo, the warehouse is usually better protected, so the risk is slightly lower than 2. During the transportation of the cargo, the risk increases to 4, and at the stage of unloading the cargo, it is estimated to be 3, since dangerous objects can occur at the final destination. Documentary processing scores are lower than 2 due to fewer opportunities to be directly exposed to terrorist activities.

Smuggling also has its own risks. At the stage of loading cargo, the score is 4, because it is more likely to hide illegal goods. During storage, the risk is reduced to 3, because the warehouse has a certain level of control. During the transport phase, the risk is also assessed as 3 due to regular security checks. But at the unloading stage, the risk again increases to 4, due to the possibility of illegal seizure of contraband.

Document processing is rated 2 because contraband can be hidden more than documents.

The theft of cargo should also be noted. At the loading stage, the risk is 3, because of the possibility of theft, but usually control is sufficient. With storage, the risk increases to 4 due to long-term storage in the warehouse. During transportation, the risk is reduced to 2 due to limited access to cargo. During unloading, the risk again rises to 3 due to the possibility of theft during the movement of the cargo. The processing of the documentary is rated at 3.

Cargo damage is rated 3 at the loading stage due to possible mishandling. During storage, the risk remains at level 3, due to the possibility of damage during long-term storage. At the stage of transportation, the risk increases to 4 due to various risk factors during the flight, such as improper loading of cargo. During unloading, the risk is reduced to 3 due to the possibility of damage during handling.

Document forgery is rated 2 at the loading, storage, and unloading stages because of the presence of the possibility of document forgery, but is less likely than other stages. At the stage of transportation, the risk increases to 3, since the use of forged documents can be misleading. The highest score is 4 for document processing, where document fraud can have a serious impact on the entire process.

Unauthorized access to cargo is rated 4 at the stage of loading and unloading of cargo. With cargo storage, the risk is reduced to 3.

Staff negligence is rated as 3 at all stages, as human factors are always present and can affect security at any stage of the process, and document processing is also rated as 3, as errors in documents can lead to serious consequences.

Non-compliance with regulatory requirements is rated 2 at almost all stages of loading, storing, transporting and unloading cargo.

Because security is a business issue, «Cargo Logistic Service Ukraine» must activate, coordinate, deploy and direct many of its existing core competencies to work together to provide effective supply chain security solutions. And to sustain success, enterprise-level security requires that the organization move specifically to security management. «Cargo Logistic Service Ukraine» should focus on strengthening security

measures to mitigate risk and prevent unauthorized access to cargo. Implement strict access controls, surveillance systems and employee training programs.

All this can be achieved by implementing effective security measures, through a new security department, which in turn must ensure a sufficient level of security of cargo handling and compliance with aviation security regulations for the further development of the company.

3.2 Planning the aviation safety and security department as a new structural unit of the company

Ensuring security involves the creation of a structural unit in the organization, the corporation's security service with its inherent set of functions and processes aimed at the practical implementation of tactical measures to ensure the security of the corporation's operation and, most importantly, the coordination of aviation security management. The enterprise security service is a structural unit of the enterprise that protects the interests of the enterprise from external and internal threats and risks; its activities include ongoing protection, detection and response, elimination, and prevention of threats to create safe conditions for the operation and development of the enterprise.

An integrated approach to the formation of the regime involves the participation of all departments of the enterprise in the process of ensuring security, in a combination of measures taken in the areas of economic security: financial, information, personnel, and material resources security.

The goal and objectives of the integrated security system of an enterprise are determined by a number of factors, including the existence of threats that may harm the enterprise's activities, the nature of their danger and the activity to which the security system should direct its efforts. In addition, it is also important to take into account the company's ability to create and maintain a security system, as well as its

interests in the market [9].

The next step after designing the security service is to create a regulatory framework to govern the work of this unit: the rules of operation of the security service, its tasks, its rights and obligations, and its relations with other units, which are set out in the company's charter, collective bargaining agreement, and internal labor regulations. In addition, job descriptions should clearly define the job responsibilities of security personnel. These measures will be the basis for the effective operation of the security service [35,17].

Building a SWOT matrix will help to predict the scenario of the security unit's development in the future, will make it possible to identify the main problems of the activity, determine the impact of the external and internal environment on it, etc.

Table 3.2 – SWOT analysis of the implementation of the security department

Strengths	**Weaknesses**
- the introduction of a specialized unit allows for more thorough control over cargo security, which reduces the risk of theft, damage and loss; - increases the trust of customers and partners in the company, which can help attract new orders and contracts; - ensures the company's compliance with international standards and safety regulations, which is necessary for air transportation; -the availability of specialized specialists allows the company to respond promptly to security incidents, minimizing possible consequences.	-limited budget for the implementation of the new unit; -lack of an internal information resource for employee training; -implementation of new security procedures and protocols may require significant effort to integrate into the company's existing operations.
Opportunities	**Threats**
- growth of air transportation in the market; - demand for safe and reliable forwarding company services; - cooperation with other aviation enterprises and international clients.	- the costs of maintaining the unit may negatively affect the company's financial stability; -the use of new security technologies may be accompanied by technical problems or failures that may affect the company's operations.

Source: made by the author

In other words, this organizational structure is relevant to the peculiarities of the enterprise's functioning, meets the requirements of the external and internal environment, has a number of other advantages, but also requires strong attention to possible budget constraints and cost increases.

At the moment «Cargo Logistic Service Ukraine», as described earlier, doesn't have a security control department. There is only an Operations department and expeditors, which in addition to their main tasks are responsible for controlling the security of the supply chain in the company.

The main tasks of the aviation safety and security department of «Cargo Logistic Service Ukraine» may include:

- development and implementation of aviation security policies and procedures;
- control of cargo security and safety;
- providing access control and monitoring of warehouses;
- education and training of personnel on security protocols;
- identification and management of potential risks associated with air cargo transportation;
- coordination with other departments and organizations;
- responding to incidents and emergencies.

To ensure the highest safety and security standards in the company, all safety-related activities must comply with the following principles:

- each employee must be constantly aware of the importance of his or her role in safety and be personally responsible for implementing all safety precautions within the scope of his or her duties. This includes constant awareness of possible threats and active participation in their prevention;
- ongoing threat analysis and risk assessment are key elements in anticipating and preventing potential security problems. Such analysis should be conducted systematically in order to identify and address threats in a timely manner;
- security procedures and recommendations must be fully integrated into daily business activities. This means that security measures should be an integral part of all

company business processes to minimize risks and improve overall security;

-the primary goal should always be the prevention of security incidents. Preventing potential threats and incidents should be a priority at all levels of the company's operations;

- comprehensive incident response plans should be developed and tested regularly. These plans will ensure a quick and effective response to assessed risks and potential threats, minimizing potential damage and disruption;

-security audits should regularly test, inspect and evaluate security measures and procedures. These audits help to maintain high security standards and identify areas for improvement;

- a high level of professionalism, knowledge and integrity among security staff is essential;

-all incidents, including security violations and any deviations from standards, must be reported, recorded and corrective action taken in a timely manner. Regularly reviewing and analyzing these incidents ensures continuous improvement in our security standards, contributing to a more secure and resilient operating environment.

These principles can serve as the basis for a robust security system at «Cargo Logistic Service Ukraine» that protects its employees and customers from potential threats and ensures the stability and continuity of business processes.

Business development requires improvement of the organizational structure of «Cargo Logistic Service Ukraine», which contributes to the most efficient achievement of goals. As can be seen from Figure 3.1, the aviation safety and security department may consist of three employees: a manager and two specialists.

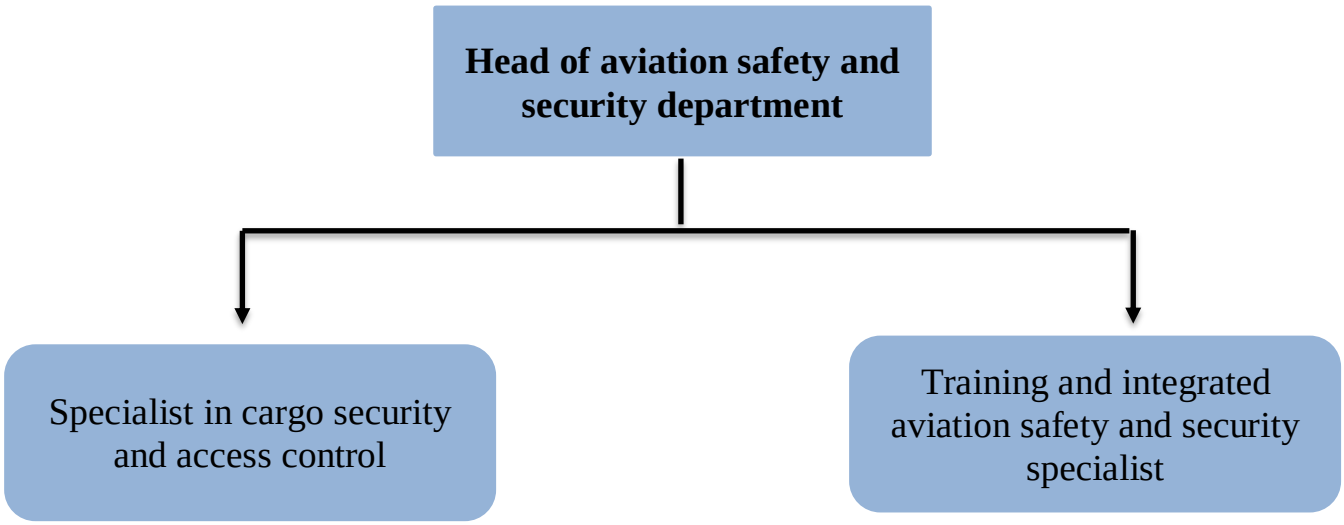


Figure 3.1– Structure of the security department

Source: made by the author

Let's look at the job responsibilities of the head and specialists of this department:

Table 3.3 – Job responsibilities of employees of the security department

Position	**Tasks**
Head of aviation safety and security department	The head of the department is the main person responsible for all cargo security during air transportation. He/she develops and implements security policies and procedures that meet international standards and regulatory requirements. The leader ensures the coordination of the department's work, cooperates with other departments of the company to effectively implement security measures. His duties include preparing reports on the state of security, analyzing the effectiveness of the implemented measures and proposing improvements. The Head of security is also responsible for holding regular meetings with the team to discuss current issues and plan further actions. He/she constantly monitors security procedures and adapts them to changes in legislation or working conditions.

The end of the Table 3.3

Cargo security and access control specialist	This specialist combines cargo security and warehouse access control responsibilities. They are responsible for thoroughly inspecting cargo before it is loaded onto flights, checking its compliance with safety rules and standards. The position is responsible for physical inspection of cargo, controlling the packaging and labeling process to prevent possible incidents during transportation. He or she is also responsible for establishing and maintaining an access control system for warehouses, using identification and access control systems. In addition, the specialist monitors video surveillance to prevent unauthorized access and theft. He prepares incident reports to maintain a high level of security.
Training and integrated aviation safety and security specialist	This person is responsible for conducting staff training and risk analysis related to air cargo transportation. They develop training programs for employees that include security protocols, hazardous materials handling, and emergency procedures. The specialist regularly conducts trainings to raise staff awareness of modern threats and methods of their prevention. In addition to training, he identifies potential risks in the transportation process, analyzes them and develops strategies to minimize these risks. He is also responsible for creating emergency action plans and coordinating their implementation.

Source: made by the author

After the documentation is completed and new positions are created, it is necessary to organize the selection of candidates for these vacant positions. It is advisable to look for personnel to fill these positions within the organization. To do this, it is necessary to evaluate possible candidates in order to select the best ones who are most suitable for the above positions. If needed, it is also possible to look for specialists with the required qualifications externally with the help of employment services or recruitment agencies.

The safety and security of employees, cargo and property is of paramount importance to the company. To ensure this safety, it is essential to have a well-defined hazard response plan that takes into account all possible risks and provides for coordinated action by all employees.

Purpose: to ensure the safety of employees, cargo and company property in the

event of a hazardous situation.

Scope of application: the plan applies to all departments and employees of «Cargo Logistic Service Ukraine».

Responsible persons:

- head of company: has overall responsibility for implementing the hazard response plan;

- head of aviation safety and security department: develops and implements the hazard response plan, coordinates the actions of employees in case of a hazardous situation;

- safety and security department members: carry out the actions of the hazard response plan.

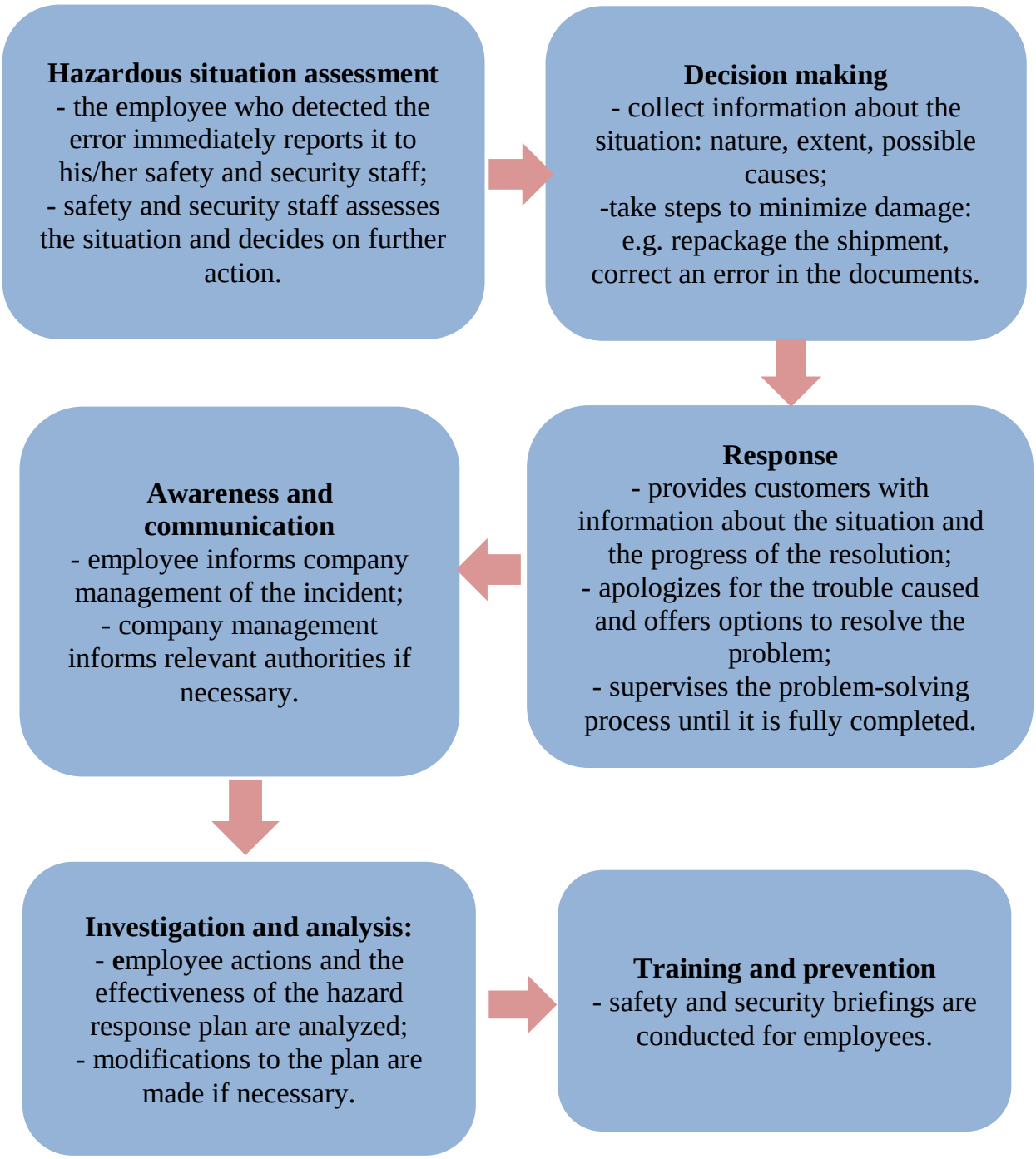


Figure 3.2– Hazard response plan

Source: made by the author

The following tables provide an example of response plans for various incident scenarios, such as documentation error, improper packaging, and smuggling.

Table 3.4 – Process for responding to an error in cargo documentation

Scenario	Actions	Responsible persons	Timeframe	Resources	Additional actions
1	2	3	4	5	6
Error in documentation					
Detect error	Check all linked documents	Operations department	Immediately	Document filing system	Train employees
Notification	Notify security department	Operations department	Within one hour	Phone, e-mail	Employee training
Correction of error	Make corrections	Security department	Within a day	Document filing system	Double check corrected documents
Notify customer	Notify customer of correction	Sales department	Within a day	Phone, e-mail	Provide corrected documents
Causal analysis	Analyze causes of error	Security department	Within a week	Reports, data	Develop measures to prevent recurrence

Source: made by the author

Table 3.5 – Process for responding to improper packaging or damaged goods

Scenario	Actions	Responsible persons	Timeframe	Resources	Additional actions
1	2	3	4	5	6
Incorrect packaging or damaged goods					
Detection of the problem	Visual inspection and control	Warehouse staff	Immediately	Stock control system	Training of employees
Isolate goods	Insulate improperly packed goods	Warehouse manager	Immediately	Warehouse	-
Notification	Notify responsible	Security department	Within one hour	Phone, e-mail	-
Fix packing	Repack goods	Warehouse staff	Within a day	Packaging materials	Training on proper packing

The end of the Table 3.5

1	2	3	4	5	6
Customer notification	Notify customer of delay and reasons	Sales department	Within a day	Phone, e-mail	Provide customer with information about new deadlines

Source: made by the author

Table 3.6 – The process of responding to smuggling

Scenario	**Actions**	**Responsible persons**	**Timeframe**	**Resources**	**Additional actions**
1	2	3	4	5	6
Contraband					
Detection of suspicious cargo	Visual inspection and control	Warehouse staff	Immediately	Scanners, control systems	Training on detection of contraband
Isolate cargo	Isolate suspicious cargo	Security department	Immediately	Warehouse	Mark isolation area
Notification	Notify law enforcement authorities	Head of security department	Immediately	Phone, e-mail	-
Interact with law enforcement	Provide information and assist in investigation	Head of security department	Immediately	Documents, video recordings	Provide access to necessary data
Analyze incident	Analyze causes and weaknesses	Security department	Within a week	Reports, data	Develop measures to prevent recurrence

Source: made by the author

3.3 Calculation of necessary costs and economic efficiency of the new security division in company

Thus, a suitable strategy for «Cargo Logistic Service Ukraine» is to plan a safety

and security department as a new structural unit of the enterprise. The creation of a new department, especially considering the specifics of the enterprise, will allow it to be quite expensive. Therefore, it is necessary to carefully plan the department project. In addition, it is important to give a comprehensive assessment of the forecast values of financial indicators in connection with the structural reorganization of the organizational structure of the company.

Table 3.7 – Predictive calculation of the cost budget for the creation of a new department

Category of expenses	Amount, UAH thousand	Description
1	2	3
Salaries for staff		
Head of the department	25,00	Monthly salary of UAH 25000
Training and integrated aviation safety and security specialist; Specialist in cargo security and access control	20,00	Monthly salary of UAH 10000 per specialist
Equipment and software		
Video monitoring systems	20,00	Installation and configuration of security monitors
Access control systems	10,00	Installation of access controls
Equipment maintenance	15,00	Regular maintenance and repair of security system
Training and certification		
Professional staff training	13,00	Courses and trainings for security specialists
Certification and licensing	10,00	Costs of obtaining necessary certificates
Documentation and consulting		
Development of policies and procedures	7,00	Engagement of consultants to develop security documents

The end of the Table 3.7

1	2	3
Audits and inspections	5,00	Regular external audits to verify compliance with standards
Total amount	125,00	

Source: made by the author

The analysis of the data in Table 3.3 shows that the cost of creating a new department for a year will amount to UAH 80.00 thousand, and the cost of attracting a specialist will be UAH 45.00 thousand, since the company does not need to incur expenses for workplace maintenance and other expenses.

According to statistics, the creation of safety and security department in enterprises increase effectiveness by 5% in the first month, and in subsequent years the increase is 7-10%, but subsequent growth requires an increase in the number of specialized staff directly.

Table 3.8 – Current expenses of the company due to non-fulfillment of security rules

Category of expenses	**Amount, UAH thousand**	**Description**
1	2	3
Losses from theft and damage	12,00	Expenses for compensation of cargo losses due to theft and damage
Fines and penalties	4,00	Fines for violation of transportation rules and customs procedures
Expenses for legal services	15,00	Legal expenses in connection with security incidents
Costs of replacing damaged equipment	18,00	Costs of repairing or replacing equipment damaged during incidents.

The end of the Table 3.8

1	2	3
Loss of customer confidence	10,00	Loss of customers due to incidents, which reduces the company's revenue
Total costs	59,00	

Source: made by the author

So, we can see that at «Cargo Logistic Service Ukraine», about 59 thousand hryvnias are spent to cover all the problems associated with security. But with the growth of the company and customers, these costs will double each time. Therefore, the safety and security department will be able to cut these costs in half over the next few years.

The problem of properly assessing the attractiveness of introducing a new security department in a company arises in the context of determining the effectiveness of this measure to improve the company's management system. It is estimated to what extent the future costs of creating and maintaining this department justify today's costs. For this purpose, financial indicators such as net present value (NPV), payback period (PI), profitability index (PI) and internal rate of return (IRR) are calculated.

Net present value (NPV) measures the difference between the present value of cash inflows and outflows over a specific period. It indicates whether an investment will be profitable, taking into account the time value of money.

The net present value is determined by the following formula:

$$\text{NPV} = \sum_{t=0}^{n} \frac{CFt}{(1+r)^t} \tag{3.1}$$

Where, CFt = cash flow at time t;

r = discount rate;

n = number of periods;

Initial Investment = initial investment cost.

Payback period (PP) is the time required for an investment to generate cash flows sufficient to recover its initial cost.

Payback period is determined by the formula:

$$\text{Payback period} = \frac{\text{Initial investment}}{\text{Average annual cash in flows}} \tag{3.2}$$

Profitability index (PI) measures the ratio of the present value of future cash flows to the initial investment. It helps in ranking projects based on their profitability per unit of investment.

$$\text{Profitability index} = \frac{\text{Present value of cash in flows}}{\text{Initial investment}} \tag{3.3}$$

Internal rate of return (IRR) is the discount rate that makes the net present value (NPV) of all cash flows from a particular investment equal to zero. It represents the project's expected rate of return.

$$\text{IRR} = \sum_{t=0}^{n} \frac{CFt}{(1+r)^t} - \text{Initial investment} \tag{3.4}$$

Table 3.9 – Estimated cost-effectiveness of creating a new security and safety department

Discount rate	10%			
1	2	3	4	5
Month	Initial Investment	Cumulative CF	Discount Factor	Discounted CF
0	-125000	-125000	1,00	-125000
1	20000	-105000	0,91	18181,82
2	20000	-85000	0,83	16528,93
3	20000	-65000	0,75	15026,30
4	20000	-45000	0,68	13660,27
5	20000	-25000	0,62	12418,43
6	20000	-5000	0,56	11289,48
7	20000	15000	0,51	10263,16
8	20000	35000	0,47	9330,15
9	20000	55000	0,42	8481,95
10	20000	75000	0,39	7710,87
11	20000	95000	0,35	7009,88
12	20000	115000	0,32	6372,62
NPV	11273,84			
Payback Period	6,25			
Profitability Index	1,09			
IRR	0,12			

Source: made by the author

Thus, the proposed measures to create a security and safety department are attractive for implementation (NPV > 0). The average payback period of the invested funds is 6,25 months. Also, the profitability index is 1,09 and the internal rate of return is 0,12 or 12%. This means that the new security department is expected to generate an average annual rate of return of 12%.

After the introduction of the security management department at «Cargo Logistic Service Ukraine», the company will receive a number of advantages, namely

- reduction of the risk of loss and damage to cargo;

- reduction of costs for replacement of damaged equipment and compensation of losses to customers;

- increasing the loyalty of existing customers and attracting new ones;

- compliance of the company with all relevant regulatory requirements and standards;

- improvement of reputation;

- optimization of operational processes;

- improved cargo and process safety leads to reduced risks;

- increased competitiveness.

Thus, a well-optimized enterprise safety and security department can help management and employees identify their own security needs and provide information about internal risk opportunities. As a result, it can be assumed that the formation of such a management structure can increase the demand for the services of the enterprise under study, increase the number of customers, stabilize income, and contribute to the development and consolidation of the enterprise not only in the domestic service market but also in the international one.

3.4 Chapter 3 summary

In Chapter 3, it can be concluded that «Cargo Logistic Service Ukraine» needs to establish an aviation safety and security department to improve its security practices. Currently, the company lacks a dedicated security department, which leads to vulnerabilities such as weak access control, insufficient training and outdated security protocols.

A safety and security department structure were proposed consisting of three employees: a manager, a cargo security and access control specialist, and a training and risk analysis specialist. The job responsibilities of each employee, their role in implementing and managing security protocols, procedures, and training programs are described in detail.

The chapter goes on to emphasize the importance of a dedicated safety and security department to enhance a company's overall security, reduce risk, and improve

its overall economic performance. By investing in a security department, a company can increase its revenues, enhance its reputation, and expand its market reach. In summary, the creation of a safety and security department is a necessary and beneficial step for «Cargo Logistic Service Ukraine» to ensure its future success and growth.

CONCLUSIONS AND RECOMMENDATIONS

With the advancement of technology, shipping by air has become quite easy. However, the security of air cargo has become a concern. Technological advancements have made it easier for thieves to steal without a trace. Thus, acting proactively is important to ensure the security of your cargo. Thus, it is imperative to apply all security measures when shipping your cargo across the border. It is equally necessary to partner with a reliable and efficient air cargo transportation provider for safe delivery of your goods.

The results of the research conducted as part of this qualification paper on the relevant topic allow us to draw the following conclusions:

Aviation security is a set of measures, resources and procedures aimed at protecting aviation from unlawful interference and ensuring the safety of passengers, crew and cargo. The qualification paper establishes that in order to continuously improve the effectiveness of the aviation security system, aviation companies must create appropriate organizational prerequisites. These conditions will ensure the functioning of special institutional mechanisms at the international, regional, national and sectoral levels. Their activities should be focused on: practical implementation of the strategy and tactics for the development and improvement of the aviation security system; solving key problems of improving the efficiency of aviation security of the enterprise. Aviation security is organized in the following main areas:

- introduction of new technologies and methods of aviation security;
- modernization of technical equipment for aviation security;
- development and implementation of effective measures to assess and minimize aviation security threats;
- improvement of the regulatory framework in the field of aviation security.

The challenge of improving aviation security efficiency is to achieve the maximum possible result with the minimum amount of resources involved labor, material and financial and in strict compliance with the requirements of current aviation

security legislation. This means preventing acts of unlawful interference, reducing their number and mitigating their consequences.

To achieve such results, it is necessary to skillfully use the entire system of these factors. Aviation security technology includes the introduction of the latest methods and approaches to protect aviation facilities and passengers. Technical support involves the provision of modern equipment and tools that allow for the effective detection and prevention of threats. Threat assessment and minimization involve regular monitoring of potential risks and development of mitigation strategies. Regulatory support requires constant updating of the legal framework and regulations governing aviation security.

Thus, only a comprehensive approach to aviation security management, which includes technological, technical, analytical and regulatory aspects, can ensure the required growth rates of the aviation security system's efficiency and reliability. The ability to integrate all these components into a single effective system will make it possible to achieve significant progress in protecting civil aviation from potential threats and ensure a high level of security for all participants in the aviation process.

The subject of the qualification work is «Cargo Logistic Service Ukraine» LCC - Ukrainian freight forwarding company specializing in international cargo transportation, in particular in the air transportation segment.

Having analyzed the performance indicators of «Cargo Logistic Service Ukraine», it was found that in 2023-2019 the airline operated rather unstable. Due to the COVID restrictions in 2020, the number of orders of the company fell, which will lead to a multiple decrease in revenues compared to 2019. Furthermore, due to the martial law in Ukraine, the supply chain had to be changed to a multimodal one, which affected the financial stability of the company. The country's restrictions continue to be an inconvenience for the organization, but over time, cargo transportation has all the potential for further development.

It should be noted that the increase in the company's production performance increases the need to introduce and implement precautions to ensure its safety. That is why the organization of the company's safety management system is an urgent issue in the process of development of this enterprise.

In the project part of the qualification work, the problems of aviation security in the company are investigated. In order to improve the level of aviation security of «Cargo Logistic Service Ukraine», it is proposed to introduce a security system organization, namely a separate unit in the company's organizational system for the security of the cargo supply chain. To substantiate the feasibility of implementing the above proposals in the activities of the studied airline, the relevant design calculations were carried out.

The obtained results of the calculations allow us to state that the project proposals developed in the qualification work are an economically viable management solution. The development of the security unit will enable the airline to increase the level of aviation security and prevent acts of unlawful interference on its territory. Implementation of the project will increase the company's efficiency by 10% and increase the company's profits, as well as reduce the annual expenses due to non-compliance with safety rules and failures.

LIST OF REFERENCES

1. Бугайко Д.О., Харазішвілі Ю.М., Ляшенко В.І. Сталий розвиток авіаційного транспорту України: стратегічні сценарії та інституційний супровід. Монографія / за ред. Ю.М. Харазішвілі; НАН України, Ін-т економіки промисловості. Київ, 2022. 276 с.

2. Гуцалюк, О. М., Бондар Ю. А. Безпековий менеджмент авіаційного транспорту в контексті сталого розвитку національної економіки. Управление экономикой: теория и практика 12.2020. С.82-94.

3. Державна авіаційна служба україни. Авіаційна безпека. URL: https://avia.gov.ua/bezpeka-aviatsiyi/aviatsijna-bezpeka/ (date of access: 27.05.2024).

4. Закон України «Про транспортно-експедиторську діяльність». (Відомості Верховної Ради України (ВВР), 2004, № 52, ст.562) зі змінами внесеними № 5060-VI від 05.07.2012, ВВР, 2013, № 28, ст.295.

5. Лінійно-функціональний тип організаційної структури управління підприємством. Pidru4niki. URL: https://pidru4niki.com/16330826/ekonomika/liniyno-funktsionalniy_tip_organizatsiynoyi_strukturi_upravlinnya_pidpriyemstvom (date of access: 27.05.2024).

6. Логістика. Авіаційна логістика. Методичні рекомендації до виконання кваліфікаційної роботи для здобувачів першого (бакалаврського) рівня вищої освіти спеціальності 073 «Менеджмент» освітньо-професійних програм «Логістика», «Авіаційна логістика» / Уклад.: С.В. Смерічевська, І.М. Суворова, В.Є. Марчук, О.В. Позняк. К.: НАУ, 2024. 50 с.

7. Про Державну програму авіаційної безпеки цивільної авіації: Закон України від 21 березня 2017 р. № 1965-VIII. Відомості Верховної Ради України. 2017. № 16. С. 199.

8. Про затвердження Авіаційних правил України «Інструкція з

організації та здійснення контролю на безпеку в аеропортах України». Офіційний вебпортал парламенту України. URL: https://zakon.rada.gov.ua/laws/show/z0594-19#Text (date of access: 27.05.2024).

9. Рудковський О. В. Служба корпоративної безпеки–механізм створення безпеки діяльності підприємства. Проблеми становлення інформаційної економіки в Україні: матеріали Міжнародної науково-практичної конференції. 2015, С.196-199.

10. Смерічевська С.В., Стріжов О.С.. Глобальні логістичні ризики та їх вплив на транспортні компанії. PhD Thesis. Національний авіаційний університет. 2023.

11. Смерічевська С.В. Діагностика стану та тенденції розвитку малого підприємництва як елемента національної інноваційної системи. Закономірності і перспективи розвитку малого підприємництва в структурі національної інноваційної системи України. 2017. С.55-72.

12. Смерічевська, С.В., Мацишина О.В. Моделі стратегічного управління ланцюгами постачання в умовах цифрової економіки: зб. матеріалів доп. учасн. XX Міжнарод. наук.-практ. конф, 2022.

13. Харазішвілі Ю. М., Бугайко Д. О. Теоретичні засади стратегічного управління безпекою авіаційної галузі у контексті забезпечення сталого розвитку національної економіки. Вестник экономической науки Украины 1 (38). 2020. Т. 1, № 38. С. 166–175.

14. 39871120 - ТОВ "КЛС УКРАЇНА" - Фінансова звітність за 2020 рік - Clarity Project. Clarity Project. URL: https://clarity-project.info/edr/39871120/finances?current_year=2020 (date of access: 27.05.2024).

15. 39871120 - ТОВ "КЛС УКРАЇНА" - Фінансова звітність за 2021 рік - Clarity Project. Clarity Project. URL: https://clarity-project.info/edr/39871120/finances?current_year=2021 (date of access: 27.05.2024).

16. 39871120 - ТОВ "КЛС УКРАЇНА" - Фінансова звітність за 2023 рік - Clarity Project. Clarity Project. URL: https://clarity-

project.info/edr/39871120/finances?current_year=2023 (date of access: 27.05.2024).

17. Agustini, E., Kareng, Y., & Victoria, O. A. The role of ICAO (international civil aviation organization) in implementing international flight safety standards. Kne Social Sciences, 2021, p.100-114.

18. Annex 19 to the Convention on International Civil Aviation. Safety Management. 2nd ed. International Civil Aviation Organization. 2016.

19. Aviation - Safety Management. Tutorialspoint. URL: https://www.tutorialspoint.com/aviation_management/aviation_management_safety.htm#:~:text=Safety%20and%20Security%20in%20Aviation&text=A%20dedicated%20team%20of%20trained,alarm%20and%20fire-extinguishing%20systems. (date of access: 27.05.2024).

20. Aviation Safety and Aviation Security. MediaRoom. URL: https://boeing.mediaroom.com/2002-07-19-Aviation-Safety-and-Aviation-Security (date of access: 27.05.2024).

21. AWB Editor | Air Waybill Creator. AWB Editor | Air Waybill Creator. URL: https://awbeditor.com/ (date of access: 27.05.2024).

22. Bieder, C., & Gould, K. P. Exploring the interrelations between safety and security: Research and management challenges. Corinne Bieder, 2020, p.105.

23. Boksberger, P., Müller, R., & Wittmer, A. The Holy Grail of Aviation: Risk, Safety and Security. Aviation Systems: Management of the Integrated Aviation Value Chain, 2021. P.335-354.

24. Brusakova, O. V., Iemets, L. O., Shulha, A. M., & Kolotik, A. S. Legal and organizational-technical assurances of aviation security. *Amazonia Investiga*, *9*(29), 2020, p. 542-549.

25. Bugaiko Dmytro. Methods for risk assessment in the aviation safety management system. Electronic scientific and practical publication in economic sciences. 2024. P.61.

26. Bugayko D., Hryhorak M., Karpun O., Molchanova K. and 5 others. Logistics in Aviation. Monograph. Wroclaw, The international university of logistics and transport. 2020. 126 p. DOI: 10.26411/978-83-960736-0-0.1-2

27. Bugayko D., Ponomarenko O., Sokolova N. Determining possibilities for applying theoretical principles of situational risk management in the aviation safety system. Eastern-European Journal of Enterprise Technologies. 2023.

28. Bugayko, Dmytro, Yuliya Lerkovska, Danylo Bugayko. Strategic management of airports efficiency and safety in the process of air and multimodal logistics transportations development. Electronic scientific and practical publication in economic sciences № 12. 2022.

29. CARGO LOGISTIC SERVICE UKRAINE LIMITED LIABILITY COMPANY (CLS UKRAINE LLC). YouControl. URL: https://youcontrol.com.ua/catalog/company_details/39871120/ (date of access: 27.05.2024).

30. Culmone C. Safety vs. Security: Is there a difference?. NATA Compliance Services. URL: https://info.natacs.aero/natacs-blog/safety-vs.-security-is-there-a-difference (date of access: 27.05.2024).

31. Doc 7300. Convention on International Civil Aviation and Annex 17. Aviation Security. International Civil Aviation Organization. 2017.

32. Doc 7300. Convention on International Civil Aviation and Annex 9. Facilitation. International Civil Aviation Organization. 2017.

33. Elib LNTU. Ensuring corporate security in the context of globalization of the world economy. URL: https://elib.lntu.edu.ua/sites/default/files/elib_upload/Савош/page12.html (date of access: 27.05.2024).

34. How Air Freight Works: The Complete Process Explained [With Flowchart]. International Cargo Express. URL: https://icecargo.com.au/how-air-freight-process-works/ (date of access: 27.05.2024).

35. Ianioglo, A., Polajeva, T.. The essence and phases of the comprehensive system of ensuring the economic security of enterprise. International journal of learning and change 9(1). 2017, p.59-74.

36. ICAO Doc 8973 – Restricted, Aviation Security Manual - thirteen Edition, International Civil Aviation Organization. 2022.

37. Impact of Security Measures on Safety. EASA. URL: https://www.easa.europa.eu/en/research-projects/impact-security-measures-safety (date of access: 27.05.2024).

38. L. Vovk, O., Tkachenko, T., Smerichevska. Implementation of modernization potential to ensure economic safety of enterprises, Laplage em Revista (International), 2021. P. 363-373.

39. Lakshmanan, R.. Air Transport Safety and Security. In Global Air Transport Management and Reshaping Business Models for the New Era. IGI Global, 2022. p. 64-97.

40. LOT Polish Airlines, lot.com. URL: https://www.lot.com/ua/ru (date of access: 27.05.2024).

41. Manual on threat assessment and risk management methodology. International Civil Aviation Organization. 2012.

42. MoghimiEsfandabadi, M. H., Djavareshkian, M. H., & Abedi, S.. Significance of Aviation Safety, Its Evaluation, and Ways to Strengthen Security. International Journal of Reliability, Risk and Safety: Theory and Application, *6*(2), 2023, 37-45.

43. Moving Air Cargo Globally Air Cargo and Mail Secure Supply Chain and Facilitation. Third Edition. International Civil Aviation Organization. 2023.

44. Safety and security awareness and monitoring in the context of aviation worker shortages. ACI World. URL: https://aci.aero/2022/06/22/safety-and-security-awareness-and-monitoring-in-the-context-of-aviation-worker-shortages/ (date of access: 27.05.2024).

45. Safety Management Manual. Doc 9859. 3th ed. Montreal: International Civil Aviation Organization. 2013.

46. Safety Management Manual. Doc 9859. 4th ed. Montreal: International Civil Aviation Organization. 2018.

47. Safety. International Civil Aviation Organization. URL: https://www.icao.int/safety/Pages/default.aspx (date of access: 27.05.2024).

48. Savchenko L., Bugayko D., Smerichevska S. Envirmental and social

responsibility in supply chains. Economics, management and administration in the coordinates of sustainable development: Scientific monograph edited by S. Smerichevskyi, T. Kosova. Riga, Latvia: Baltija Publishing, 2021. P.596-616.

49. Smerichevska, S., Poberezhna, Z., Mykhalchenko, O., Shtyk, Y., Pokanevych, Y.. Modeling and Evaluation of Organizational and Economic Support for Sustainable Development of Transport Enterprises: Innovative and Ecological Aspects. Financial and Credit Activity Problems of Theory and Practice. 4(51), 2023. 218–229.

50. Stolzer, A. J., Sumwalt, R. L., & Goglia, J. J. Safety management systems in aviation. CRC Press, 2023.

51. The importance of risk assessment in aviation security - Uniting Aviation. Uniting Aviation. URL: https://unitingaviation.com/news/security-facilitation/the-importance-of-risk-assessment-in-aviation-security/ (date of access: 27.05.2024).

52. Virissimo, M. C. G., & Vaz-Ferreira, L.. Synergies and Tensions Between Safety and Security in Civil Aviation. Campos Neutrais-Revista Latino-Americana de Relações Internacionais, *5*(3), 2023, 76-88.

53. Wipf, H.. Safety Versus Security in Aviation. The Coupling of Safety and Security: Exploring Interrelations in Theory and Practice, 2020. P. 29-41.