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International Business/ Trade

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The analysis of alternative transportation routes in commission of TNT Express

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## ABSTRACT

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Krasnobaeva Tatiana    The analysis of alternative transportation routes in commission of TNT Express  
TNT Express Company

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Within financial crises, TNT Express along with its clients has faced financial difficulties. Cheljabinsk zinc factory is one of the major clients of TNT Express in Russia, which also faced financial problems, was concerning to re-organize the route of transporting Zinc concentrates from ports of Peru to Cheljabinks. In order to save the business relationship TNT Express had to look for opportunities to reduce costs of the existing transportation route.

This thesis was aimed to research the alternative routes of transporting concentrates from ports of Peru to Cheljabinsk with the costs and time reduction. Three main theoretical schemes are the role of a logistics company in the transportation chain, the role of TNT Express in Russian market and the company's competitors and the existing problems which are affecting the company's work efficiency.

The empirical part was aimed to find out which alternative way is more profitable for the company. The calculations and routes comparison was made to identify the most economic way of transportation.

The results show that the second route (direct with the transfer in St.Petersburg) is the most profitable, but at the same time the route in big-bags packaging are more expensive than the second route, but it has few advantages over it.

# TIIVISTELMÄ

## KYMENLAAKSON AMMATIKORKEAKOULU

### Kansainvälinen kauppa

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TNT Express company ja sen asiakkaat ovat olleet taloudellisissa ongelmissa tämän finanssikriisin aikana. Cheljabinsk sinkkitehdas, joka on yksi TNT:n suurista asiakkaista Venäjällä, on myös ollut taloudellisissa ongelmissa. TNT Express harkitsi sinkkitiivisteiden kuljetusreitin muuttamista Perun ja Cheljabinskin välillä. Pitääkseen yllä liikesuhdetta TNT Expressin piti etsiä mahdollisuuksia alentaa nykyisen kuljetusreitin aiheuttamia kustannuksia.

Tämän tutkielman tavoite oli etsiä vaihtoehtoisia reittejä kuljettaakseen tiivisteitä satamista Perusta Cheljabinskiin, löytääkseen kustannustehokkaimman ja nopeimman tavan. Kolme pääasiallista teoreettista luonnosta ovat logistiikkafirman rooli kuljetusketjussa, TNT Expressin rooli kuljetusketjussa, TNT Expressin rooli Venäjän markkinoilla, sekä firman kilpailijoiden ja muiden vallitsevien ongelmien rooli, sekä miten ne vaikuttavat firman tehokkuuteen.

Empiirinen puoli tässä tutkielmassa keskittyi löytämään mikä vaihtoehto on eniten kannattava firmalle. Laskelmat ja reittien vertailut tehtiin löytääkseen kannattavin kuljetustapa.

Tulokset näyttävät toisen reitin (suora, jossa on yksi vaihto Pietarissa Novorossijskin sijaan) olevan kannattavin. Toisaalta reitti suuri-kassi-pakkauksille on kalliimpi kuin toinen reitti, mutta sillä on etuja.

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## 1. INTRODUCTION

This study will explore the functions and services of the multinational TNT and will focus on TNT Express, the Russian division. A client of TNT, Cheljabinsk zinc factory faces a problem regarding the transportation of its goods. This client is an important one for TNT and therefore the client's problem is TNT's problem. In harmony with the company's philosophy, the aim is to help this key client solve the problem. Consequently, TNT Express decided to make a research and investigate alternative transportation routes, which can breed numerous advantages.

Cheljabinsk zinc factory is one of the largest producers of zinc products. Catalysed by financial crisis, Cheljabinsk zinc factory is forced to consider alternative ways for transporting zinc concentrates from Peru to Russia. TNT Express provided the assignment to outline and analyse different routes in order to present a beneficial alternative in terms of costs and time.

### 1.1 Objectives of the study

To find out what problems can arise for a modern, internationally operating logistics company in Russia. The thesis work will examine the TNT and its services, values and structure and a feasible general code of conduct in the current, challenging environment of logistics.

To develop three alternatives for transporting the cargo from the point of origin in Peru to designated destination in Russia, and evaluate each one. The alternatives will be produced according to the characteristics of both client and service provider to guarantee the best possible solution for both parties.

### 1.2 Methodology

To meet and achieve the objectives of this project, two types of information will be combined: primary and secondary data.

The primary sources of information consist mainly of interviews with representatives from TNT Express Russia and relevant managers of Cheljabinsk zinc factory. These sources provide up-to date and reliable information about the needs and wants on the one hand and the options to meet these requirements on the other. With the help of the answers to specific questions and the information provided, this thesis work will determine the best route and the suitable 'accoutrement' for the client. The primary sources are the foundation of this work for the reason that they reflect both parties' thoughts on the subject accurately.

The secondary research will start with literature review, assessing and analysing existing information related to the objectives of the thesis work. It will help to define present difficulties encountered by a modern internationally operating logistics company in Russia. Not only will literature be used in which third parties write about the actors on the Russian logistics market, but it is also not neglected to see what the competitors of TNT have to say about themselves.

The existing literature was studied to form the theoretical framework for the thesis project. A detailed explanation needs to be given about the different factors that influence every potential route, before one can grasp the possibilities and limitations of each. In accordance with what is achievable and what is not, a recommendation is given.

### 1.3 Utility of the report

The findings of the report can be used to make a decision based on facts and not on assumptions, for the best route available for Cheljabinsk zinc factory to transport its goods between Peru and Russia. The presentation of the recommendations assists TNT Express Russia in a way that the client can be served with these very same recommendations. Moreover, the advice is in line with the corporate characteristics of the assignment provider.

#### 1.4 Suggestions for further research

On 22 March 2010, the Russian Prime Minister Vladimir Putin gave the green light for the first direct trans-Atlantic freight route. The route named Ecubex connects Guayaquil (Ecuador), Balboa (Panama), Rotterdam (The Netherlands) and St. Petersburg (Russia). This study was focused on transport along a very similar route. However, up to this point in time, no empirical data is available because the Ecubex route has not yet been used. Obviously, the establishment of this route goes hand in hand with benefits for the user. As mentioned in the last part of this thesis, improvements are made with respect to time and costs. It is suggested that this route is further researched and analysed, since it has potentially very positive consequences for Russia as a whole, companies and consumers. Nevertheless, there might be some strings attached and it seems only logical to bring these to the surface as well, by means of thorough research.

## 2. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

First, word logistics was mentioned in works of French military theorist Antoine Anri Dzhomini (1779-1869). He was the author of capital work on stories of revolutionary wars in 15 volumes. In the works he asserted that logistics covers a wide range of the services including planning, management, material, technical and food maintenance of armies, and also definition of a place of their disposition, a construction of roads and equipment movement (Van Chreveld, 1977).

Nowadays, logistics is defined as whole science including such aspects as transportation, control, sales management, delivery and customer service (Frazelle, 2002). Logistics is the process of planning and controlling the movements of goods, materials and services from point of origin to the point of consumption for the purpose to satisfy customer needs (Tilanus, 1997). Johnson and Woods, 1997 have described logistics as the process of materials moving into, through and out of firm.

A commonality of the above logistics definitions is a broad range of activities concerned the movement of goods from producer to the customer. In general, logistics is the process to get right materials to the right place on time.

According to the official definition of the International Federation of Freight Forwarders Associations, FIATA, 2010 logistic services are *“services of any kind relating to the carriage (performed by single mode or multimodal transport means), consolidation, storage, handling, packing or distribution of the goods as well as ancillary and advisory services in connection therewith, including but not limited to customs and fiscal matters, declaring the goods for official purposes, procuring insurance of the goods and collecting or procuring payment or documents relating to the goods. Freight Forwarding Services also include logistical services with modern information and communication technology in connection with the carriage, handling or storage of the goods, and de facto total supply chain*

*management. These services can be tailored to meet the flexible application of the services provided*

A supply chain is a set of facilities, suppliers, customers, products and methods of controlling inventory, purchasing and distribution. The chain links suppliers and customers, beginning with the production of raw material by a supplier and ending with the consumption of a product by the customer. In a supply chain the flow of goods between supplier and customer passes through several stages, and each stage may consist of many facilities (Sabri & Beamon 2000, 581-598).

All the operations, which were mentioned above, form a significant part of the activities of numerous modern companies that are operating on unstable and highly dynamic markets where demand and supply change rapidly (Chernov 2004, 37-54).

## 2.1 The role of a logistics company in transportation chain

### 2.1.1 The main principles of a logistics company

The main processes within a logistics company are the following:

- Management

This is described as “the process of planning, leading, organizing and controlling people within a group in order to achieve goals (Grant, 2006). Within a logistics company, management consists of organising all logistics activities to achieve clearly defined objectives, such as planning the route of transportation and controlling the movement of goods during the transport.

- Coordination

Pankratov, 2003, 54-117 defines the concept of coordination as the skilful and effective interaction of movements to achieve customer satisfaction with delivering goods to the right place at the right time.

Coordination is often defined as teamwork, meaning that for successful coordinated interactions the following principles are required. Firstly, participants should be interested in the overall aim and method of achievement. Secondly, they should understand that the success of the whole depends on them, as they are the parts. Finally, each of the participants should follow the coordinated programme (Grant, 2006).

Coordinating work of the participants of the logistics chain, such as: suppliers, customs workers, drivers and warehouse workers will lead to success-efficient delivery to the right place at the right time (Davenport, 1993).

- Distribution

Distribution in the context of a logistics company is a process of bringing all the operations in order, cargo preparation and delivery and regulating the relationship between the participants of the chain. Furthermore, this function helps to spread and share information amongst the members of the transportation chain. As a consequence, the efficiency of the whole transportation process increases (Harmon, 1993).

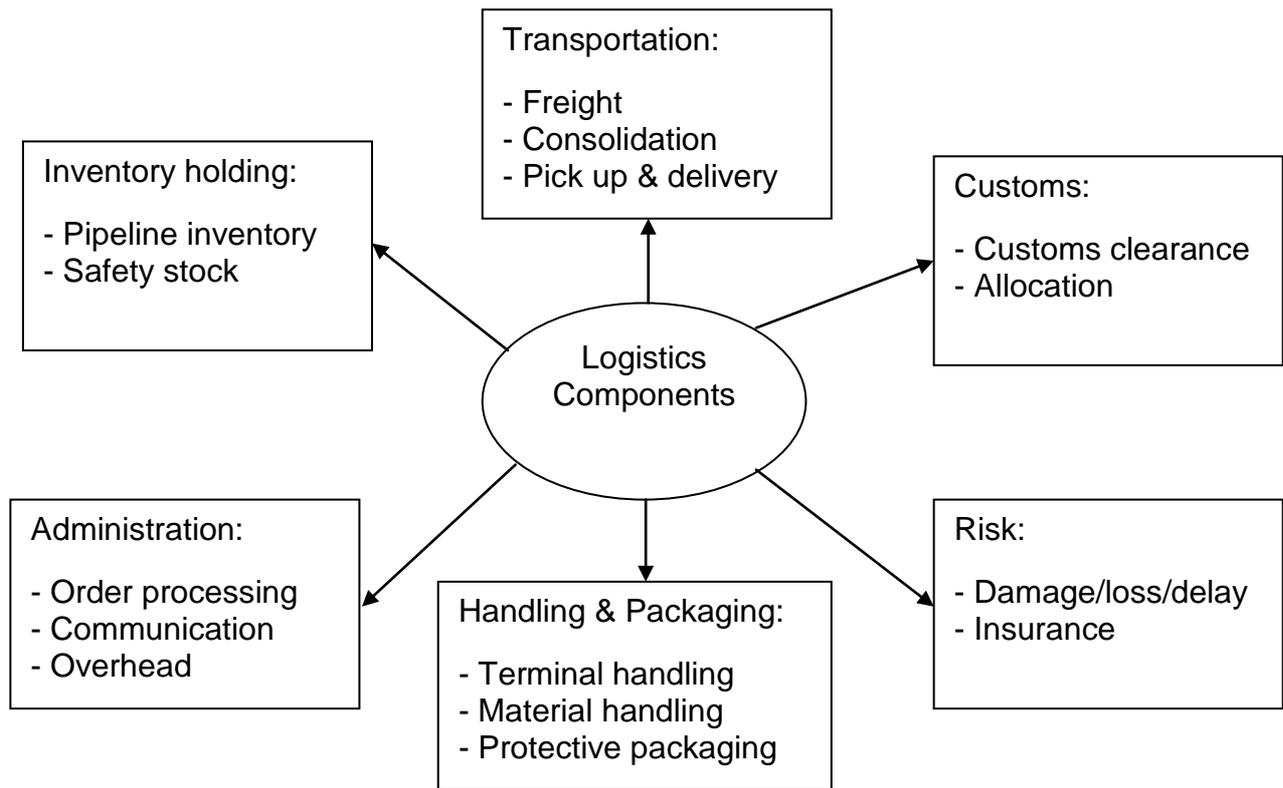


Figure 1. Logistics components (based on Pezold, 2001)

### 2.1.2 The main services of a logistics company

#### Logistics company's services

##### Transportation

- Freight transportation
- Pickup delivery
- Consolidation

##### Administration

- Order processing
- Communication
- Overhead

##### Handling and Packaging

- Terminal handling
- Material handling
- Protective packaging (Pezold, 2001)

In warehousing company provides services with regard to storing the goods. The process of consolidation is closely related to warehousing, meaning that the goods of the clients can be stored and sorted in the company's warehouse (Gromova, Persianova, 2003).

Customs is an authority, which controls the flow of goods through borders and collects customs duties. It is a very important aspect, which can add costs to the transportation process and enlarge the period needed for delivering the goods. The logistics company handles the preparation of the required documents and deals with the customs declaration procedure (Kazakov, 1974).

The customer should be informed about the shipment details of the order. The company keeps the customer informed about when the goods were shipped, how they were shipped and the estimated delivery duration. Customer service is responsible for those activities (Pezold, 2001).

The broad range of services, which the logistics company offers to the customers and suppliers emphasises the importance of the company in the transportation chain.

### 2.1.3 The advantages of using a logistics company

The advantages of using a logistics company for exporters/importers:

- Door-to-door service. The company takes the product from the point of origin to the point of sale with a minimum of interruptions and delay.

- Route planning. The company has responsibility for the transportation scheme arrangements to deliver the goods at the lowest costs within the shortest time possible.
- Route management. The company transports the goods to the agreed place at correct time.
- Inventory control.
- Customs services. The company takes the responsibility to prepare the documents needed for customs clearance.
- Documentation. The company handles all papers that are necessary for the process of transportation.
- Security. The company handles the goods with care, so that the customer and supplier can be sure to get the exact amount of goods in the exact condition as they were sent.
- Providing the customer with information. The company contacts the customer in different stages of the route to offer relevant updates (Bloomberg, 2002).

To conclude, the combination of advantages underlines the vital role of the logistics company. As a result of the activities of the logistics company, the process of transportation runs smoothly for both the supplier and customer.

### 3. THE ACTIVITY ANALYSIS

#### 3.1 TNT Express Company profile

TNT Express is an international company specialised in delivering goods, documents, parcels and corporate goods. Hence, the company delivers goods from point A to point B according to the customers' needs (Slack, 2006).

The company's transportation network includes more than 900 warehousing and sorting centres, which handles more than 3.3 million

goods, parcels and packages in more than 200 countries per year. TNT Company aims to deliver goods as fast as possible to the final destination. In order to achieve this goal, the company uses its own air, water and road networks. (TNT, 2010)

### 3.1.1 The TNT Company Network

Air network of TNT Company:

- 42 own planes
- 62 airport services which operate in 24 countries
- European sorting Hub in Lezje, Belgium, the biggest express centre in Europe, which is working 24 hours per day and handles more than 70 percent of the total amount of handled goods (TNT, 2010)

Road network of TNT company:

- The longest road network in Europe, which connects warehouses in 27 countries. Every week, 3,300 routes are travelled through the European countries.
- The European road network is responsible for almost 85 percent of the international routes of the company.
- More than 18,000 cars.
- The main sorting centre is located in Arnhem, The Netherlands. This centre works 24 hours per day, 6 days per week and operates 6500 parcels in hour (can be brought up to 10,500 parcels) and goods for 70 destinations (can be brought up to 110 destinations). (TNT, 2010)

TNT Express is the part of a holding that provides services in the area of international post and express delivery. This holding also includes Royal TNT Post, TNT Logistics and TNT mail (Slack, 2007)

## TNT Express



Figure 2. The structure of TNT (based on TNT, 2010)

TNT Express is divided into smaller departments and business units. The head office is in Amsterdam, The Netherlands and is responsible for strategic management and control of the departments of TNT in different countries. TNT Express is a part of International Business Unit which the head office in Windsor, United Kingdom. (TNT, 2010)

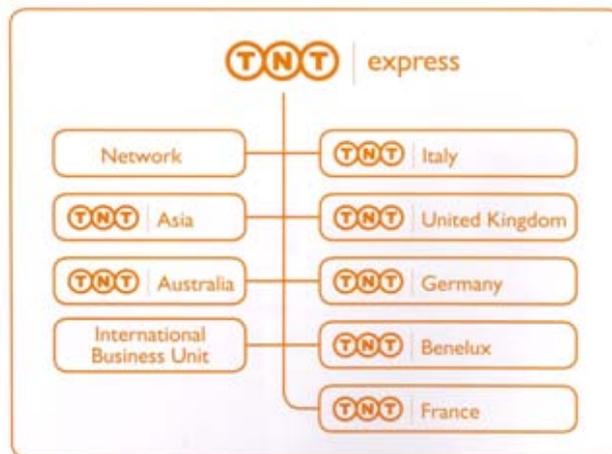


Figure 2. The structure of TNT (based on TNT, 2010)

TNT operates in more than 200 countries and employs 162,000 people. TNT Express employs around 43,000 workers and their staff is growing yearly. Since 2006, the company works under one brand name: TNT. This reflects the international character of the TNT. The fact that the company works under one name creates an opportunity to improve TNT company's brand recognition in the world. In addition, work efficiency amongst the departments is increased. In this project, a closer look will be taken at the Russian department of TNT Express (Slack, 2006)

### 3.2 TNT Express Russia, St.Petersburg

In 1989 the company starts operations in Moscow and St.Petersburg through agents. Later, in 1998, the first operating center was opened in St.Petersburg. Nowadays, there 30 offices in 20 Russian cities (Kudrina, 2007).

In Russia transportation services are regulated by Rules of transportation activity (The Governmental order of the Russian Federation from September 8<sup>th</sup>, 2006, 554), and also the Civil Code of the Russian Federation (Chapter 41 " Transport expedition", item 801-806), which regulates on the base of legislation contract description, rights of all the sides, duties and liabilities of the logistics company.

According to the legislation, logistics company activities include all kinds of transportational operations. It also includes such services as consolidation of goods, packing and casing.

First, company was specialized on delivering documents and small parcels but later it started the operations in providing services for transporting bigger cargoes and chemicals (Kudrina, 2007).

Company's services in delivering documents and small parcels:

- 9:00 Express- goods delivery till 9 o'clock next day to cities in Russia and Europe
- 12:00 Express- goods delivery till 12 o'clock next day to cities in Russia and Europe
- Priority-first class delivery to major cities in Russia
- Domestic-the same day goods delivery within St.Petersburg region
- Siberia and Far East part of Russia delivery
- Global Express- air transportation within short period
- ITLL
- Economy Express
- Pick up goods
- Customs services
- Special services- transporting expensive, dangerous and fragile goods, making routes and consolidation
- Customer service
- Flexible payment system
- Control- gives an opportunity to follow the goods location during the transportation process (TNT Russia, 2009)

Company's services in delivering large goods and cargoes as extra to the basic scheme:

- Pick up services, by using heavy vessels with high capacity
- Coordination multimodal transportation
- Customs clearance and document preparation
- Customs declaration
- Clients representation all over the transportation route
- Consolidation (Kudrina, 2009)

### 3.2.1 The structure of TNT Express, Russian department

There are several departments of TNT Express Russia (based on Kudrina, 2009):

1. Customer Service (CS). This department is part of the Sales and Marketing division. At the same time, CS is divided into two groups: the first one is responsible for processing incoming calls, the so called 'Front Line'. The operations of the second group, named 'Support', are order processing and keeping customers informed about the goods during the time of transportation.
2. Sales Department. This is the second part of the Sales and Marketing division. This department is oriented on increasing sales and the amount of customers. The responsibilities of the company are to organise sales process details, find potential clients, discover new opportunities and strategic advantages, save costs and time.
  - a. Clients Interface Technologies is the special database programme, which helps to handle the parcels fast. As a consequence, the work efficiency and service quality of the company are increase.
3. Major Accounts Department. In this department, the major clients of TNT Express are pooled together. Large companies such as Gazprom, PSI, Nokia, IKEA, football club ZENIT, Eurosib (official dealer of BMW), Evidence Clinical and Pharmaceutical Research are company's clients and provide the largest part of TNT Express' revenue.
  - a. The Major Account Department was organized to give extra attention and priority services to those clients.
4. Special Service Department. This department is responsible for transporting expensive, fragile and dangerous goods. This department does the planning and calculation of individual routes for special groups of products. Furthermore, documentation and certificate preparation is done for chemicals, clothing, and few other types of goods. Also, the Special

Service Department is arranging insurance for the goods. This division offers a service, which is called Private Delivery, meaning that a supervisor from TNT Express is travelling together with the client's goods for the whole route to guarantee absolute control and security.

5. The Operational Service (OPS) Department consists of the actors listed below:
  - a. Drivers. These do the physical pick-up and delivery. The goods are picked up from the clients and delivered to the company's warehouse from where they are transferred to the final destination. This part of the department makes the actual delivery.
  - b. Warehousing. This department provides services such as sorting, scaling, packing and distributing the goods.
  - c. Database. TNT Express uses an electronic database where the information of all letters, parcels and goods, which were ever delivered by the company are collected and stored. Database is part of the Operational Department. Putting the goods information in the electronic database helps the tracking process.
  - d. Delivery Department. This department deals with order processing, organises pick-up and delivery services, handles claims for loss or damage, makes the schedules and delivery times for the drivers and coordinates the planned and organised transportation routes.
6. Customs Clearance Department
  - a. This department is concerned with import and export activities of the TNT Express clients. It is divided into three groups: 1) brokers 2) people making declarations 3) group Nokia. The activities of this division are to prepare documents for goods to be exported or imported. Moreover, this department represents the clients in government offices and organisations.

7. Finance and Administration Department (F&A) plays an important role in the company and closely cooperates with the Sales and Marketing department, Operational Service and Customer Service department. The activities of F&A are:
  - a. Fiscal management of the payments and operations
  - b. Accounting and Budgetary
  - c. Income collection and salary management
  - d. Giving advice on pricing and costs
  - e. Debt collecting
  - f. Completing statistical report forms
  - g. In charge of routine maintenance of the electronic accounting network

F&A is divided in two smaller subgroups: Billing and Credit Control and Financial group. The first one is responsible for billing and invoicing. Based on the information from the operational department, they send bills to the clients. The Credit controller is also responsible for debt collecting, advising about tariffs and costs. In addition, the Financial Group provides bookkeeping services.

TNT Express is an international company with a common budget, meaning that the financial part of the company's activities in different countries is strictly controlled and regulated.

Since 2006, Moscow is the head department of all offices in Russia. This is the only office that is financially connected with the head quarters in the Netherlands. The St. Petersburg department is obliged to provide all the necessary fiscal information to the Moscow department from where the information will be send to the head office in the Netherlands.

8. CIT, the department of information technology. The work of this department evolves around the company's facilities. It provides services

concerning computer systems, Internet, telephone lines and electronic databases.

9. General Service Department takes care of other office facilities and provides the employees with pleasant working environment.
  
10. Human Resources Department (HR). The work of this department is essential for the company. The main task of HR is teambuilding and recruiting professionals that match with the company. Services in the form communication training and performance management are also provided by this department.
  
11. Security Department is responsible for safeguarding goods all along the delivery process and while in the warehouse.

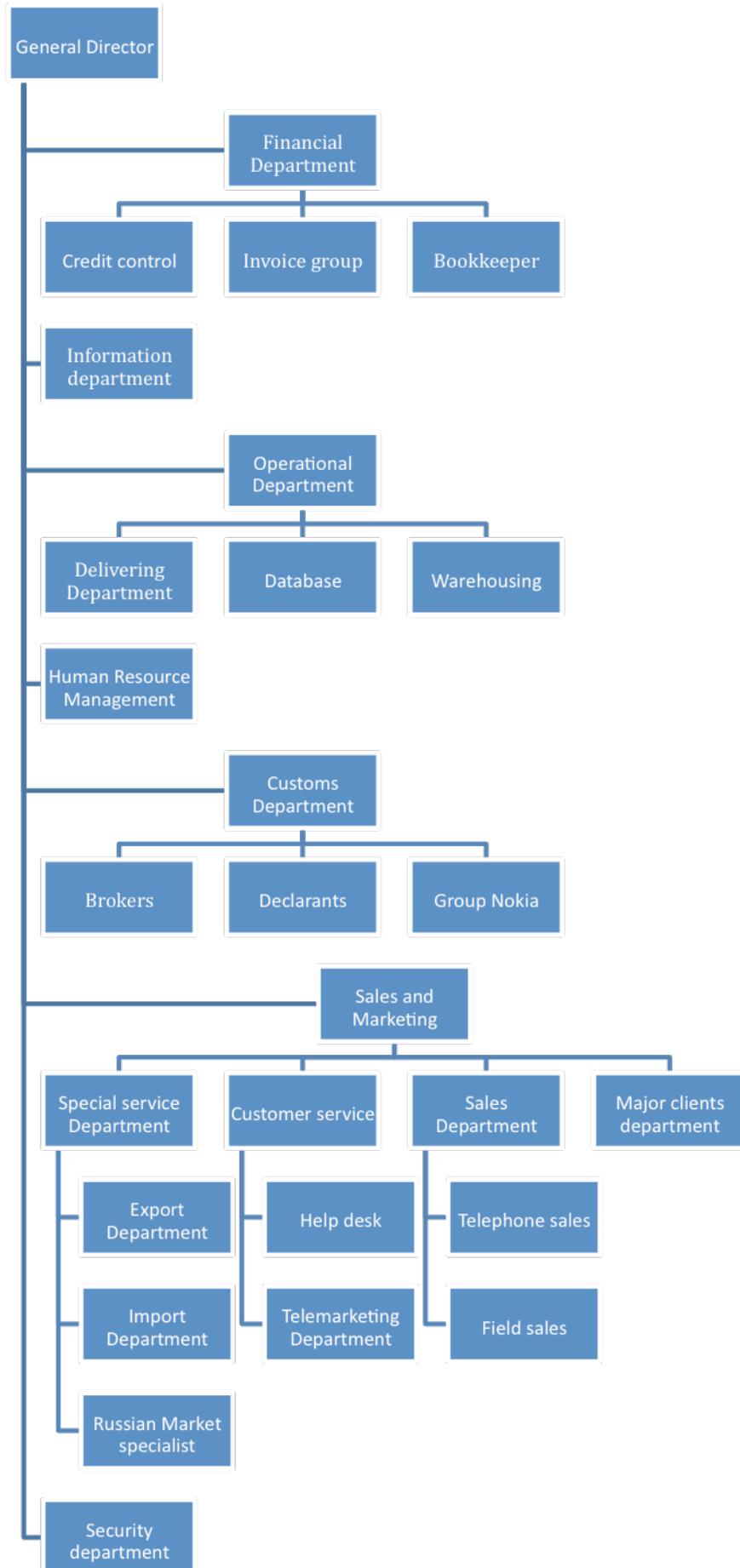


Figure 4. The organisational structure of the TNT Express Russian department (based on Kudrina, 2009)

There are two systems of Information exchange which are used in TNT Express globally. Firstly, SAP provides the financial information. Secondly, Main Frame stores details of goods, transportation routes and other goods characteristics. The work of these two systems results in an adequate information flow within the company (TNT Russia, 2010)

### 3.3 The position of TNT Express in Russian market

In order to identify the position of TNT Express on the market, it is important to pay more attention to the Company's environment in relation with the competitors.

According to Philip Kotler, 2003 all firms have competitors. Even if there were only one airline, the airline would have to worry about trains, buses, cars, bicycles and even people who might prefer to walk to their destination". Hence, there are no companies that do not have competitors.

Michael Porter, 1991 suggests several ways for a company to stay competitive, one of them is to be aware of its competitors' activities. Moreover he divides all companies into 4 groups.

- Leaders have highest market share and control.
- Second place players have a large percentage of market share and considered as potential leaders.
- Companies that control 30% of the market and work by using innovations of their competitors.
- Newcomers are new on the market and searching for their position on it.

In the time of the Soviet Union, transportation was done by vertically integrated monopolies controlled by central government. To illustrate, one

organisation owned and operated airports, airlines and airplanes manufacturing facilities. The same monopoly was found in the postal sector. The Russian post was the only company that provided delivery services. That was quite remarkable in the world largest state, where opportunities for developing transportation services are huge (Vasiljevich, 1994).

Only in the beginning of the 1980's, new companies could enter the market and start their operations (Dvorkovich, 2004). With the dissolution of the Soviet Union in December 1991, Russia has experienced changes that established the transition from central planning to the market-based economy, leading to the boom in the business sector of Russia. Nowadays, an enormous amount of transportation companies exists in Russia and TNT Express is one of them with as main competitors DHL and UPS (Curtis, 1996). The table below shows the comparison between those three companies by several factors.

Table 1. The comparison of competitors

	<b>TNT</b>	<b>DHL</b>	<b>UPS</b>
Slogan	<i>Sure we can</i>	<i>Committed to delivering you the world</i>	<i>What can Brown do for you</i>
Start up in Russia	1989	1984	1989
Regional centers	13	20	5
Offices in Russia	30	150	12
Vehicles	250	700	
Employees	1000	2500	
Revenue growth by year 2009	30%	18%	20%
Extended accessibility	From 8 till 20:00 in week days, from 10 till 14 on Saturday	From 10:00 till 14:00, Pick up service till 13:00.	From 8 till 18:00 weekdays
Fuel surcharge	No added costs	+4% (exchange rate risk)	+4.5 % (bank transfer)
Rate 1euro/rouble	Central Bank RF	Central Bank RF + 4% (gas adding)	Central Bank RF
Time Definite Delivery	9:00 Express, 12:00 Express, Priority, Same day delivery	StartDay Express (9:00), MidDay Express (12:00). Domestic same day delivery	The second week day delivery
I-Solutions	PartnerShip Express, I-Solutions, Express Shipper	DHL Connect, WinShip, Easy Ship	UPS On-line Solutions
POD	24/7 Customer service, after 20:00 all incoming calls are directed to Moscow department	24/7 Customer service (Moscow department), after 19:00 all incoming calls to every department in Russia are directed to Moscow	8 working hours Customer Service

(based on TNT, 2010; DHL, 2010; UPS, 2010)

According to the number of regional centres and the amount of offices, DHL takes the leading position on the Russian market. DHL employs 2500 workers, which is twice as much as TNT Express. There can be multiple reasons for that. The first one is that DHL has started its operations 5 years earlier than TNT and UPS. The period of 5 years in the times of

1980's in Russia counts as 20 nowadays, meaning that DHL is quite some years ahead in transportation operations in Russia.

The main difference between TNT Express and DHL in Russia is customer orientation. DHL is oriented on a customer as a private person, whereas TNT Express is focused on businesses. TNT specialises on delivering companies' documentaries, parcels and goods. This fact explains the lesser amount of offices of TNT Express.

At first sight, the amount of offices and regional centres makes DHL company the leader on the market, but when the company's focus is taken in consideration, one has no other choice than to name TNT Express as the leader of business-oriented logistics on the Russian market.

### 3.4 Problems affecting Company's work efficiency

Problems and risks are a huge part of doing business. However, every company is trying to increase the profitability by minimizing the risks (Chugunov, 1999).

#### 3.4.1 Risk management

Risk can be defined as probability of a loss happening multiplied by the consequences that will occur if the loss happens. The level of risk depends of several factors, which can be divided in 2 groups: external and internal. The external factors are laws, taxation, customs regulations, the relationship with other companies and customers, natural disasters. The internal factors include poor education and work experience of the employees, understaffed company, lack of teamwork and leadership skills, low working efficiency and an unfriendly working environment (Chew, 2008).

The huge variety of risks can be classified in different groups such as financial, production, technical and etc. At the same time, there is no common classification, which can be applied to all the fields (Chew 2008).

Table 2 shows the risks classification, which can be applied to the transportation area and therefore to logistics companies.

Table 2. The complete guide to business risk management

<b>Risk types</b>	<b>Definition</b>	<b>Risk classification</b>	<b>Risk reasons</b>
(1)	(2)	(3)	(4)
Production	The risk of production process damages	<ul style="list-style-type: none"> <li>- technical</li> <li>- organisational</li> <li>- strikes</li> <li>- natural disaster risks</li> </ul>	Low quality of raw material and production components. Weak production management and organisation. Technical damages in production equipment.
Commercial	The risks in the transportation processes	<ul style="list-style-type: none"> <li>- insurance</li> <li>- damage risk</li> </ul>	Instability in sales. Low quality in providing transportation services. Crashes, loses and damages of goods during the transportation.
Financial	The risk	<ul style="list-style-type: none"> <li>- payment</li> <li>- inflation;</li> <li>- credit;</li> <li>- tax;</li> <li>- the risk of economical instability</li> </ul>	The difference in exchange rate. Unstable inflation, changes in taxation system. The changes in transportation tariffs. The changes of interest rate.
International trade risks	The risk of International Business Operations	<ul style="list-style-type: none"> <li>- marketing</li> <li>- choosing partner</li> <li>- distributor/agent</li> <li>- change in customs tariffs</li> <li>- exchange rate</li> </ul>	Unstable political and economical environment in certain countries. The mistakes in marketing strategy. The change of currency rate. The risk of choosing unreliable partners, agents and distributors. The change of customs tariffs.
Social	Risk related to the Company's staff	<ul style="list-style-type: none"> <li>- professional</li> <li>- understaffed company</li> <li>- reveal company secrets</li> </ul>	Understaffed company. Poor work experience and education of the employees. Lack of teamwork. Language barrier. Reveal company secrets.
Innovation	Risks in technological innovations	<ul style="list-style-type: none"> <li>- investment</li> <li>- credit</li> <li>- lising</li> </ul>	Low work efficiency in innovation development. The depts.

(Based on Frankell, 2005)

The risks classification is shown in table 2. It is applied to the transportation area and includes such risks, which can occur in the transportation process.

Numerous specialists have written articles and books concerning managing risks, saying that it reduces the taxes and costs (Crouhy, 2000).

Risk management is the process of minimizing the risks. It includes certain steps (based on Frankell, 2005):

1. Identifying the risk
2. Risk classification
3. Risk measurement
4. Choosing the ways to minimize the risks
5. Providing the services to minimize the risks
6. Risk analysis

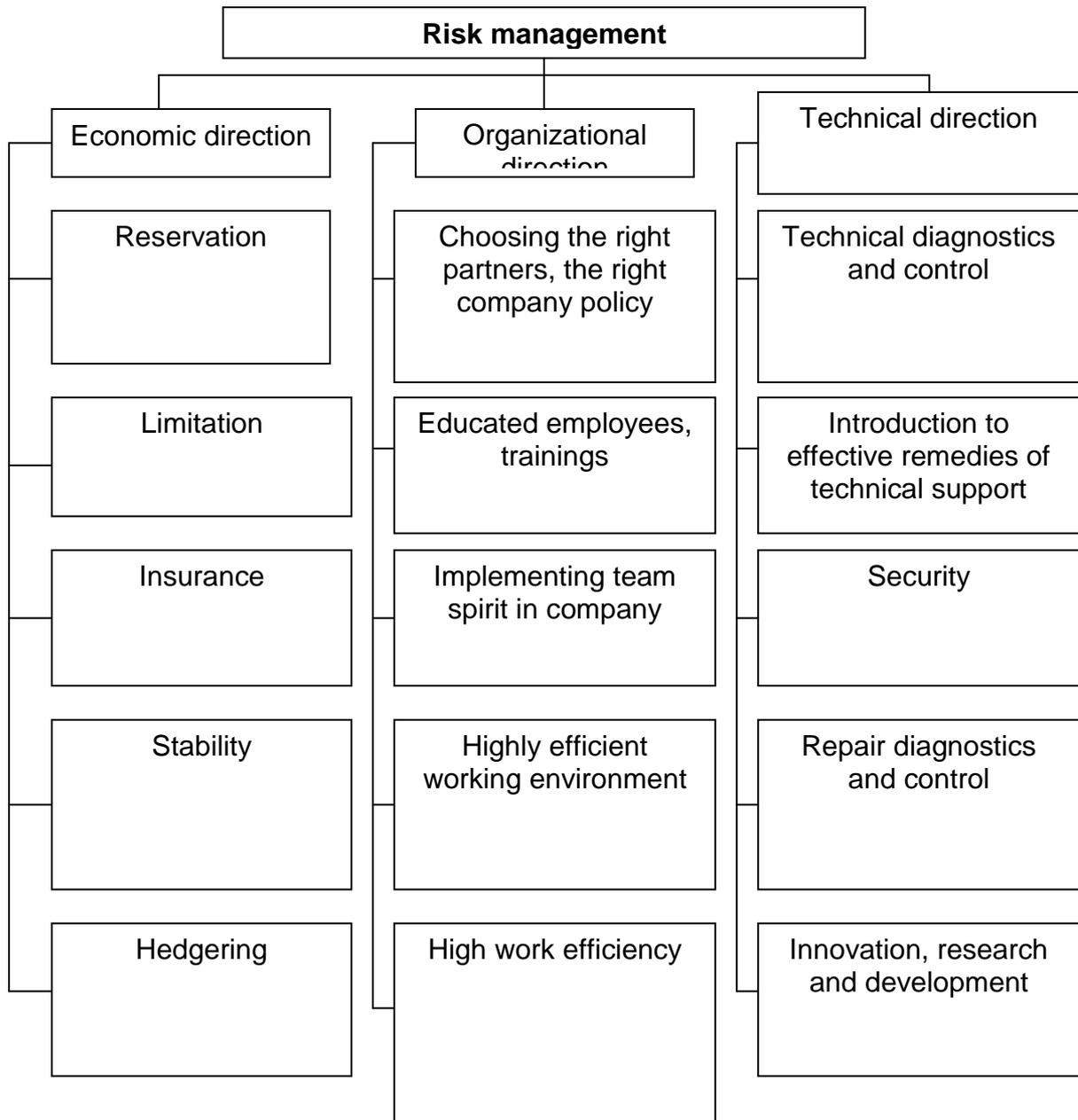


Figure 5. Risk management (Based on Spencer Pickett, 2005; Chugunov, 1999)

Effective risk management leads to positive results and a minimal number of risks. It offers guidelines and actions to prevent risks. Economic operations include reservation, limitation and Insurance.

Team spirit provides high work efficiency on the organisational level. A positive working attitude is important in every field of business. In logistics, a positive attitude leads to improvements regarding preparation, implementation and control. Furthermore, thorough customs preparation and goods declaration leads to risk minimization.

Technical direction is defined as a group of services including repair diagnostics and control, security and technical support. Customer service and information support are important components of risk minimization (Spencer Pickett, 2005).

#### 3.4.2 Difficulties and opportunities of Russian market for logistics company

Russia is ranked 162 (out of 183) in 2010 for “Trading across borders” (Doing business, 2010). The low position in the ranking can be explained by customs regulation, which requires a large number of documents, a lot of effort and considerable time. Seriously undeveloped infrastructure causes logistical challenges, especially accessing markets outside of major cities.

Russia has been badly hit by the international financial crisis in 2008-2009 (BBC, 2009), which led to:

- slump in commodity prices
- collapse of the financial markets
- restricted access to external financing
- rising unemployment
- consequent drop in internal consumption

“Industries most seriously affected were the financial services, IT, real estate & construction, mining & metals and automotive sectors” (Baker & McKenzie 2009, p 56).

The political challenges for Russia are “burdensome regulatory regimes, inadequate IPR protection, pervasive corruption and disrespect for rule of law, inconsistent application of laws and regulations” (Country Commercial Guide, 2010).

There are social factors that negatively affect the business operations of an international logistics company (or any company for that matter) in Russia. There is low life expectancy of the total population, 66 years (Male: 59.33 years). This fact combined with a low birth rate leads to negative population growth rate. Russia is on the place 13 in the world for HIV/Aids related deaths (CIA world factbook, 2010). English is not that widely spoken, meaning that language barrier can cause communication problems and increase the possibility of risks.

“An incomplete transition from central planning has led to an insufficiently integrated economy and disparities in wealth distribution, geographically and demographically” (Country Commercial Guide, 2010).

At the same time, the Russian market provides many opportunities for international logistics companies. The Russian Federation is the biggest country in the world, which means that there will always be a need for (long-distance) transportation operations. High demand for transportation services combined with quite low competition and high quality service providers leads to great potential (RussiaToday, 2009).

Furthermore, Russia has a better tax climate for companies since 1 January 2009. To address the economic downturn in Russia the maximum tax rate is reduced to 20% from 24% for profit tax (PricewaterhouseCoopers, 2009). The following tax rates apply to dividends:

- 0% tax on dividends payable by Russian and foreign companies qualifying as “strategic investments”;

- 9% tax on dividends payable by Russian and foreign companies to Russian shareholders in all other cases; and
- 15% tax on dividends payable by Russian companies to foreign legal entities (PricewaterhouseCoopers, 2009).

To conclude, Russia remains a country with huge potential for foreign investors. However, many sectors require large investments, and with rich natural resources, Russia does have possibilities to realize these investments. The last ten years have also raised the wants and demands of the Russian consumer, and the market for fast moving consumer goods and services has a long way yet to expand (Deloitte, 2009).

#### 4. TRANSPORTATIONAL ROUTE DESCRIPTION

Cheljabinsk zinc factory is one of the largest producers of zinc products. Catalysed by financial crisis, Cheljabinsk zinc factory is considering an alternative way for transporting zinc concentrates from Peru to Russia. Cheljabinsk is a client of TNT and to serve this important client, TNT Express decided to make a research and investigate alternative transportation routes, which can breed a reduction of the costs.

##### 4.1. The basic route description

###### 4.1.1 Product characteristics

The cargo consists of lead and zinc concentrates. These materials are received from natural ore in the course of its clearing by a method of physical and chemical branch of undesirable components.

The materials gained by zinc/lead mines are raw materials for primary zinc/lead processing and further use in the industry.

Technical characteristics of the cargo are that the zinc concentrate consists basically of a zinc blend with an impurity pirit, and also contains a

small amount halkopirit and galetin (Kasparov, 2010). The zinc maintenance in a concentrate makes up for about 40-50 % of weight of a material. A corner of a natural slope of a zinc concentrate at the air maintenance  $\alpha = 35^\circ$ , and at natural humidity (10-11%) -  $48^\circ$ . Is accepted to sea transportation with limits humidity from 5 to 10.5 % (Sevrjukov, 2010)

Concentrates are produced in mines on the western coast of South America and Australia. The main share of concentrates is carried out from the ports of Peru. The loading on ocean vessels is done in the Peruvian ports Salaverri (Salaverry) and Kallao (Callao). The long route requires transportation by vessels of large tonnage (Usually it is done in bulk ships of type Handy DWCC 20-30 thousand tonnes). Figure 6 illustrates the route scheme. It shows that after the goods leave ports of Peru it leads to Europe by ocean. The port of transfer is based on the continent for the accumulation and the further transportation in small sizes to other ports of destination. In the basic variant, the port of transfer is Antwerp. After transfer in Antwerp the cargo follows its way to Novorossijsk, and from there by rail to Western Siberia on factories of Chelyabinsk (in particular Cheljabinsk zinc factory).

#### 4.1.2 The transportation route characteristics

The port of Antwerp is the second largest port in Europe and the fourth largest in the world. Approximately 20,000 courts annually from 70 countries come into port, transporting more than 95.4 million tons of cargo. Mostly oil, raw materials for the chemical industry, minerals and finished goods, for example cars. The total warehouse area is 300 hectares (Apatcev, 2003)

One of the main reasons why the company has chosen this port for the transportation chain is the high suitability for raw materials and mineral goods transportation. Despite the fact that the Dutch company TNT has a good opportunity to use the largest port of Europe, Rotterdam (the

Netherlands), TNT has long relationship with the Belgium port and has been using it for years (Pluzhnikov, 1999).

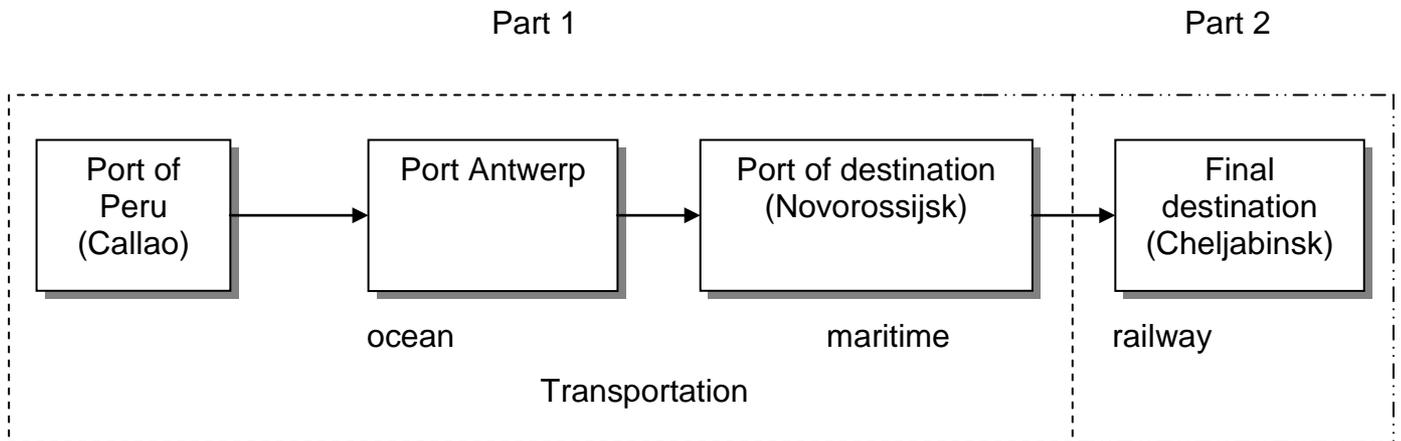


Figure 6. Basic scheme of transportation

The first part of the scheme: Ocean and sea transportation

Ocean bulk ships are loaded in the Peruvian ports Salaverri (Salaverry) and Callao (Callao), and unloaded in the port of Antwerp. The cargo of lead/zinc concentrates is transferred onto sea-crafts of smaller deadweight, which carry out delivery to the port of destination, port Novorossisk. A transfer of that kind is feasible because of a conjuncture of the charter market of bulk ships, since it is less effort to find a vessel of smaller deadweight for the given delivery and advantageous in terms of costs, than to use ocean bulk ships for further transportation to the final destination.

The volume of the cargo is 2,000-1,200 tonnes. This is the amount of the monthly supply, according to the contract with the factory. This supply is limited by production capacity of the factory and lack of sufficient storage space at the factory. In this project, the amount of the cargo is 500 tonnes. The calculations are made according to this figure.

According to tariffs and costs in summer term 2009:

- Ocean freight on FIOS equals to 40 euro/tonnes
- Reloading in Antwerp 7.5 euro/tonnes
- Freight Antwerp-Novorossiysk -35 euro/tonnes

Loading on a vessel in the Peruvian ports is carried out by means of conveyors, and cranes with a load-carrying capacity 5-40 tonnes carry out unloading operations in Antwerp. Furthermore, ore machines in capacity of 0.8-2.5 cubic metres (g/p:2-6.5 tonnes).

While loading it is necessary to pay attention to the placement of the cargo. This needs to be done strictly in order to avoid excessive instability of a vessel, bending moments and cargo displacement.

The second part of the route is railway transportation. After the goods are transported to Novorossiysk, they will be brought to Cheljabinsk zinc factory in western Siberia by railway. The distance between the cities is 2,691 km. Even though the maximum capacity of one wagon is 69 tonnes, the weight of concentrates, which are transported, is 62 tonnes. That costs 46,328 rub per wagon (tax free price) or 54,667 rub per wagon with tax (18 % since 01.01.2006). According to the Central bank exchange rate on 1.12.2009, the price per tonne would be 30, 70 Euros (All calculations are made by using the system Poljus, which is also used by Railway operates, updated in 2009).

Transportation of zinc and lead concentrates according to "Rules of transportations of cargoes on railway transportation" should be carried out in special containers; 'Hypronickel' type CK-2-2.2 (Maslova, Bazhuk, Kovalik, 2004).

The cargo has to be transported in open semi-wagons with permission of Ministry of Railways of Russia on the basis of special transportation terms. It has to be taken into account that the maintenance with the

consignor of guarantees and acceptance of measures by it to a non-admission frozenness, cargo losses along the line and negative consequences for environment (Newspaper Pravda, 2009).

This route was organised by preparing specially equipped semi-wagons in advance (model 12-726, load-carrying capacity – 69 tonnes). The floor is covered by dense paper. In order to avoid that the top layer of the cargo is blown from the semi-wagon during the transportation it is necessary to cover the goods with paper size 6x200x400 mm.

At Cheljabinsk zinc factory the cargos are unloaded where it awaits the processing. The semi-wagons get cleaned from the rest of the goods, dust and dense paper.

This transportation scheme was well used by partners over the years. After the importing the goods, they are processed and prepared for re-export.

The Black Sea region also was attractive in connection with necessity of deliveries by small parties since provided possibility of all-the-year-round work with courts of the small tonnage.

It is important to note that in the past, port Novorossijsk was used for cargo of zinc/lead concentrates transportation to enterprises in Kazakhstan and sent to the factories of Chelyabinsk. This relationship with Kazakhstan opens windows for trade development with Russia.

#### 4.2 The change of the transportation route

The change of transportation route is made to achieve increased speed and better quality in delivering the goods.

As was mentioned before, the main route of delivering the goods (port of Peru, Port Antwerp, Novorossijsk and Cheljabinsk) has been working well for a long time. During the financial crisis, Cheljabinsk zinc factory faced financial problems and was forced to improve the already existing route to reduce the costs.

In this project it is suggested to change the second part of the route, meaning to replace the Novorossijsk port and lead the route through North Sea, North-East part of Baltic Sea and Finnish Gulf to St. Petersburg and finally to Cheljabinsk.

The port of St. Petersburg is the largest port in North-West of Russia. It is located on islands of the Neva River, in the Eastern part of the Finnish gulf of the Baltic Sea. For the project port Lomonosov is used, which is one of the largest and strategically most important ports of the St. Petersburg waters, located 30 km South-West of St. Petersburg (Apatcev,2003)

Lomonosov port has several advantages over the other ports, such as a good location and port appointment. This means that this port was made especially for transporting minerals, e.g. lead and zinc concentrates. In addition, the port has a good connection to the railway, which is of utter importance since the goods are transported by railway to Cheljabinsk afterwards. (Apatcev)

There are few reasons why the change of the route to St. Petersburg instead of Novorossijsk might be beneficial. First of all, it can reduce the costs for the maritime transportation. The charter rate (according to summer term 2009) from Antwerp to St. Petersburg is 15 \$per tonne in summer and 25\$ per tonne in winter. This is quite an advantage compared to the 35\$ per tonne rate for the route Antwerp-Novorossijsk.

Secondly, there is an opportunity to shorten the duration of the transport. One condition is that the vessel does not go through the Kiel Canal, but goes from the North Sea to the Baltic Sea through the Skagerrak and

Kattegat. Following this route, the distance from the port of Antwerp to the port of St. Petersburg will be 1,395 miles. The length of the route between the ports of Antwerp and Novorossijsk equals 3,622 miles. (The distances between ports are calculated by computer program 'PTOPVIAC Maritime Distance Tables')

Thirdly, the distance from St. Petersburg to Cheljabinsk is less than the distance from Novorossijsk to Cheljabinsk. The route St.Petersburg-Cheljabinsk equals 2,346 kilometres, which is 300 kilometres less than the route Novorossijsk-Cheljabinsk. This fact shows that it is possible to reduce the costs and time on the railway transportation as well.

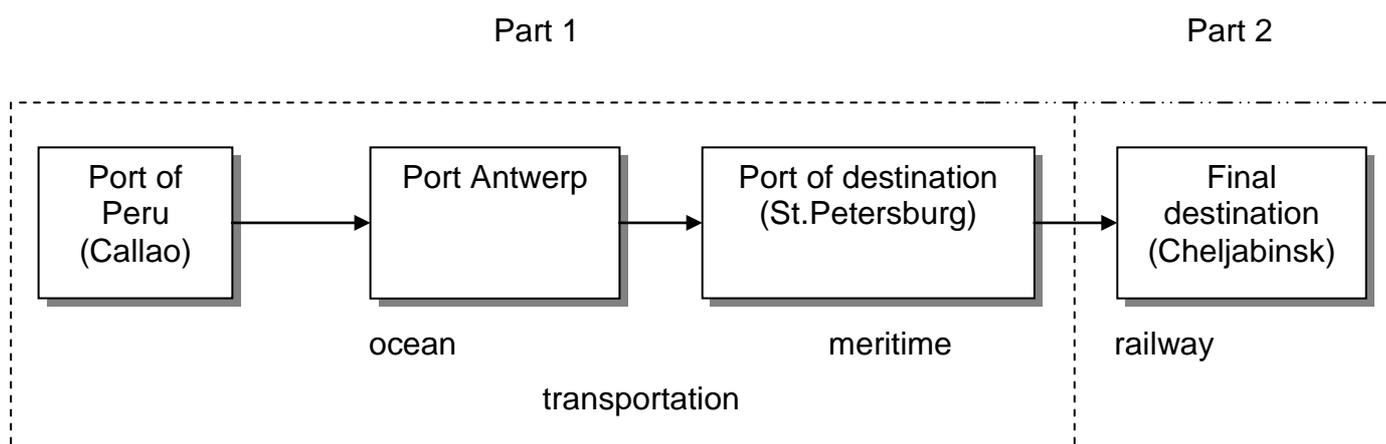


Figure 7. The alternative route of transportation

Keeping in mind that the capacity of the wagon, in which the goods are transported to Cheljabinsk, is 62 tonnes, the transportation costs for the route from St. Petersburg to the final destination is 43,659 rubles per wagon (without taxes). The tax is 18% (on 01.06.2006) and brings the price up to 51,518 rubles per wagon. The price for the tonne equals to 831 Rubles or 26.70 Euros. (All calculations are made by using the programme Poljus).

Compared to the standard route, the first part of the scheme will remain unchanged. As a result, the transportation route from ports of Peru to port Antwerp will follow the same way while using the same vessels as in the original route.

It is important to be aware of the fact that by transporting cargo in open semi-wagons, the environment negatively affects the quality of the concentrates. Moreover, open semi-wagons cause partial loss of cargo due to difficulties to get the remains of the cargo from the wagon after transportation. Besides, cargo might get blow out during the transportation. As a result, that the alternative route will not only change the port, but the packaging as well.

TNT Express offers to use big bags for the transportation of the concentrates, in order to reduce the loss of goods. Of course, big bags will bring extra costs to the factory, but at the same time it is worth to make a small research about the possible advantages of this type of packaging.

The decision to transport the cargo in big bags would introduce three variants:

- Vessel-to-warehouse
- Warehouse-to-warehouse
- Warehouse-to-semi-wagon

After the ocean transportation, which stays the same in alternative variant, the goods are unloaded to the open warehouse area, where they are by overloaded into a bunker installation and from here packed into big bags. Type 'Himpack' load-carrying capacity of 1 tonne (Lukinskij,2001,p-228).

### 4.3 Customs

At the given variant of shipment special value is got by features of customs regulation since at the cargo, which is under a customs mode, transport packing changes. It is necessary to define accurately competency of realisation of similar operation in connection with consideration of the new transport-technological scheme of delivery of cargo of zinc/lead concentrates with packing them in big-bags (Customs Code, 2003)

By the new customs legislation the given operation can be done in customs warehouses (a constant zone of the customs control).

According to article 78 point 2, unloading and overloading (transfer) places are a zone of the customs control, and according to point 3 of the same article, on demand of the person who is carrying out cargo operations in sea port, the goods (cargoes) can be in a place of their unloading and an overload (transfer) without a premise on a warehouse of time storage during the term necessary for realisation of specified operations, but within the terms established according to article 103 of the Customs code of the Russian Federation (Customs Code, 2003)

According to article 215 (paragraph 5 of the Customs code of the Russian Federation), a customs warehouse is a customs mode at which imported on customs territory of the Russian Federation the goods are stored under the customs control without payment of duties, taxes and without application of interdictions and restrictions of economic character. The customs warehouse is a zone of the customs control (item 2 item 216).

Employees who are responsible for the goods, and their representatives have the right to make with the goods which are under customs locks, the usual operations necessary for maintenance of safety of the goods in an invariable condition, to examine and measure the goods, to move them within a customs warehouse provided that these operations will not entail

change of a condition of the goods, infringement of their packing and (or) changes of the imposed means of identification.

Employees who are responsible for the goods, and their representatives can make operations on sampling the goods, simple assembly operations, and also the operations necessary for preparation of the goods to sale and transportation, including crushing of parties, formation of sendings, sorting, packing, repacking, marks, the operations necessary for improvement of commodity qualities. The given operations are made with the permission of customs body.

The customs body has the right to refuse delivery of the permission to carrying out of the specified operations only in the event that their realisation is entailed loss of the goods or change of their essential properties (article 219, points 1.2).

On territory of the Russian Federation cargo follows in mode of profit tax on factories to Cheljabinsk where there is processing in a mode of processing of the goods in customs territory. Further cargo is subject to re-export.

The foreign goods and products of their processing are released from the (export) customs duties and taxes.

Operations on processing of the goods concern:

- goods manufacturing, including installation, assemblage and adjustment under other goods;
- goods processing;
- goods repair, including their restoration and a putting in order;
- use of some goods which promote manufacture of products of processing or facilitate it even if these goods are in full or in part consumed in the course of processing.

According to the customs regulations of Russian Federation, the goods which have been imported in order to be processed and prepared for re-export are allowed to get the customs fees back. This regulation is only relevant if the preparation process does not last longer than 2 years.

The foreign goods and products of their processing are released from the export customs duties and taxes. To the specified goods and products economic policy measures are not applied.

The regulations with regard to the changing of transport packaging appear to be well founded in the Customs code of the Russian Federation. Thus, it is possible to consider the given scheme as an alternative variant of transporting zinc concentrates.

## 5. THE RESULT

The basic scheme of transportation was well used before the Cheljabinsk zinc factory faced financial problems. TNT Express made a research to find alternative ways of transportation to reduce time and costs for its client. During the project work, three transportation schemes were researched and compared:

- scheme 1: Kallao-Antwerp-Novorossiysk-Cheljabinsk;
- scheme 2: Kallao-Antwerp-Sankt-Peterburg-Cheljabinsk (direct variant);
- scheme 3: Kallao-Antwerp-Sankt-Peterburg-Cheljabinsk (in big-bags).

### 5.1 The route comparisson

The ocean freight Kallao - Antwerp zinc/lead concentrates cargo delivery costs 40euro / tonne for all three schemes. The rate of the transfer of cargo in port Antwerp is 7.5 euro/tonne.

Sea freight from Antwerp to Novorossiysk (first scheme) and from Antwerp to St. Petersburg (second and third schemes) costs respectively 35 euro per tonne and 25 euro per tonne.

In the ports Novorossiysk and St. Petersburg, the transfer is carried out in first and second scheme by a direct variant under the rate 4.6 euro/tonne and 2.7 euro/tonne, and in the third scheme by variants "vessel-warehouse" and "warehouse-car" the rate is 2.3 euro/tonne for a bulk cargo and 3.3 euro/tonne for cargo in a big-bag.

The cost of forwarding services on cargo tonne, in all three schemes makes 0.3 euro/tonne and 0.5 euro/tonne for ports Novorossiysk and St.-Petersburg.

The rate of 'draught survey' (all three schemes) and supervisory survey of cargo after loading in semi-wagons in ports Novorossiysk and St.-Petersburg are accepted for 0.12 euro/tonne and 0.2 euro/tonne.

For shipment in bulk in the first and second schemes cost of the preparation of cars to load and send of the given cargo on special conditions. Also, conditions of performance of measures to prevent frozenness and materials considering the expense and work, will make 0.6 euro/tonne and 4 euro/tonne.

As weighing and tracking of cars under the rate 0.8 euro/tonne and 0.16 euro/tonne. While considering the third scheme, packaging in big-bags, it is necessary to take the costs of big-bags into account, which is 6.5 euro per one. However, big-bags can be used up to 3 times and the load-carrying capacity of one big-bag is one tonne. Use cost equals to 3.25 euro/tonne, and the cost of loading is 3 euro/tonne.

The railway rates and tariffs of the first scheme is 2.5 percent; 30.7 euro/tonne and 0.77 euro/tonne. In schemes 2 and 3 the rate is 28.95 euro/tonne and 0.72 euro/tonne.

The summary of all the calculations will give an overview of all the costs and will make the most attractive option easy to identify.

After calculating every step of all three schemes, the following numbers became apparent. The transportation costs per tonne of schemes one, two and three are respectively 127.25 euro/tonne, 113.75 euro/tonne and 115.6 euro/tonne.

Table 3. Financial evaluation of schemes

<b>Elements</b>	<b>Transportational costs on all three routes per 1 tonne, euro</b>		
	<b>Callao-Antwerp-Novorossiysk-Cheljabinsk</b>	<b>Callao-Antwerp-St.Petersburg-Cheljabinsk</b>	<b>Callao-Antwerp-St.Petersburg-Cheljabinsk (in big bags)</b>
Ocean freight	40	40	40
Reloading in Antwerp	7.5	7.5	7.5
Sea freight	35	25	25
Reloading in port •straight variant variant warehouse-wagon (big bags)	4.6	2.7	3.3 +2.3
Port supervision	0.3	0.5	0.5
Loading			3
Big bag price			3.25
Draft survey	0.12	0.12	0.12
Supervisor checking	0.2	0.2	
Wagon preparation	0.6	0.6	
Wagon weight	0.8	0.8	0.8
Control	0.16	0.16	0.16
Railway tariff	30.7	28.95	28.95
Special services	6.5	6.5	
Railway services (2,5% of railway tariff)	0.77	0.72	0.72
Cargo protection	4	4	

Storage( nessecary)	if		0.27
<b>Total:</b>		127.25	113.75
			115.60

## 5.2 The results analysis

The most favourable scheme from the point of view of cost expenses is second scheme of delivery through the port of St. Petersburg. However, the variant of shipment into big-bags is not significantly less attractive, as the costs of this are only 2 Euros higher per tonne. Besides, the safety of the cargo and its quality are better served in this variant. Therefore, its favourability rises.

## 6. THE ROUTE'S FUTURE DEVELOPMENT

On 22 March 2010, the Russian Prime Minister Vladimir Putin, Danish Premier Lars Lokke Rasmussen and Equadorian Minister of Industries Xavier Abad Vicuna established the first direct trans-Atlantic freight route. The route named Ecubex connects Guayaquil (Ecuador), Balboa (Panama), Rotterdam (The Netherlands) and St. Petersburg (Russia). This freight is operated by the company Maersk Line, which is the American department of the Danish Company AP Moller Maersk (1tv, 2010).

Ecuador is the main supplier of bananas on the world market. For Russia, Ecuador is the leader of fruit import and for Ecuador, Russia is the largest importer of bananas.

Before, cargoes made stops in Rotterdam, Antwerp or in Hamburg, from where they have been transported to Russia by trucks. Ecubex allows direct delivery without stops in transit ports (echo.msk, 2010).

According to Carlos Lema, the Ecuadorian trade representative in Russia, who gave a speech on the opening ceremony of the Ecubex, the time of fruits delivery, which is now one month drops to 20 days. The fact, that the route does not go through transit ports, but going straight to St. Petersburg saves time up to 1.5 weeks. It means that Ecubex opens a great window of opportunity to develop import/export relationship between Latin countries and Russia (bmf.2010).

The direct trans-Atlantic line as Vladimir Putin has declared, allows expanding trade and promoting growth of investments. The head of the Russian government claims that the goods delivered from South American countries become cheaper. "It is for consumer benefit; less delivery days and direct transportation without stops in transit ports. This equals to price reduction for the whole transportation route" was declared by the Russian Prime minister (Russia24,2010).

The establishment of the direct transport route from Ecuador to Russia gives a great opportunity for the project work development. Nowadays, Ecubex allows delivering fruits only, but maybe in future it will concern different types of products, including chemicals. There is also a possibility to cooperate with other Latin countries and to use the direct transportation to St. Petersburg.

The project work offers a scheme for transporting chemicals from Peru to Russia, and suggests a stop in Antwerp to change vessels, which take much time and extra costs. The opportunity of direct transportation leads to the cutting of business cost and time reduction. Therefore, one might even speak about an amazing change for extensive business development.

## 7. CONCLUSION

The thesis work was aimed to research alternative routes of zinc and tank concentrates transportation from ports of Peru to Cheljabinsk in order to reduce time and costs.

The transportation analysis of the basic route, which has been working before, was made. There were described goods characteristics and route details. The basic route was successfully working until the moment of the financial crises. TNT Express was motivated to search for the alternative ways, which can lead to costs and time reduction.

The research of the alternative way, which leads to St.Petersburg after port of Antwerp instead of Novorossiysk allows to find the possibility to reduce the costs during the whole transportation process: sea freight, railway delivery and unloading processes. At the same time it also allows to reduce delivery time, by the sea freight.

The new route analysis included geographical, financial and time aspects, but also technological- unloading and carrying the concentrates, organizational, as a route management by TNT Express and customs services aspects.

In railway transportation the concentrates were delivered in semivagons, which increased the risk of environmentally negative affects and also risk of the goods loss. In this project work, another alternative variant was considered. It included such service as packaging the goods in big bags. It will concern extra costs, which are according to the calculations from table 3 are 2 euros per tonne more, compare to the most profitable route variant 2. The price difference is not high compare to the advantages it might give to the client.

At first, according to the calculations, seems that the second transportation route is the most profitable, but if we take into account the fact of the

goods packaging in big bags, which allows to increase the quality of the goods and decrease the risk of the cargo loss it makes the alternative route 3 become the best option for the clients to reduce costs, time and increase the products quality.

The alternative variant 3 can be used by TNT in delivering zinc and tank concentrates from ports of Peru to St.Petersburg. It also opens further opportunities in delivering similar product for the similar routes.

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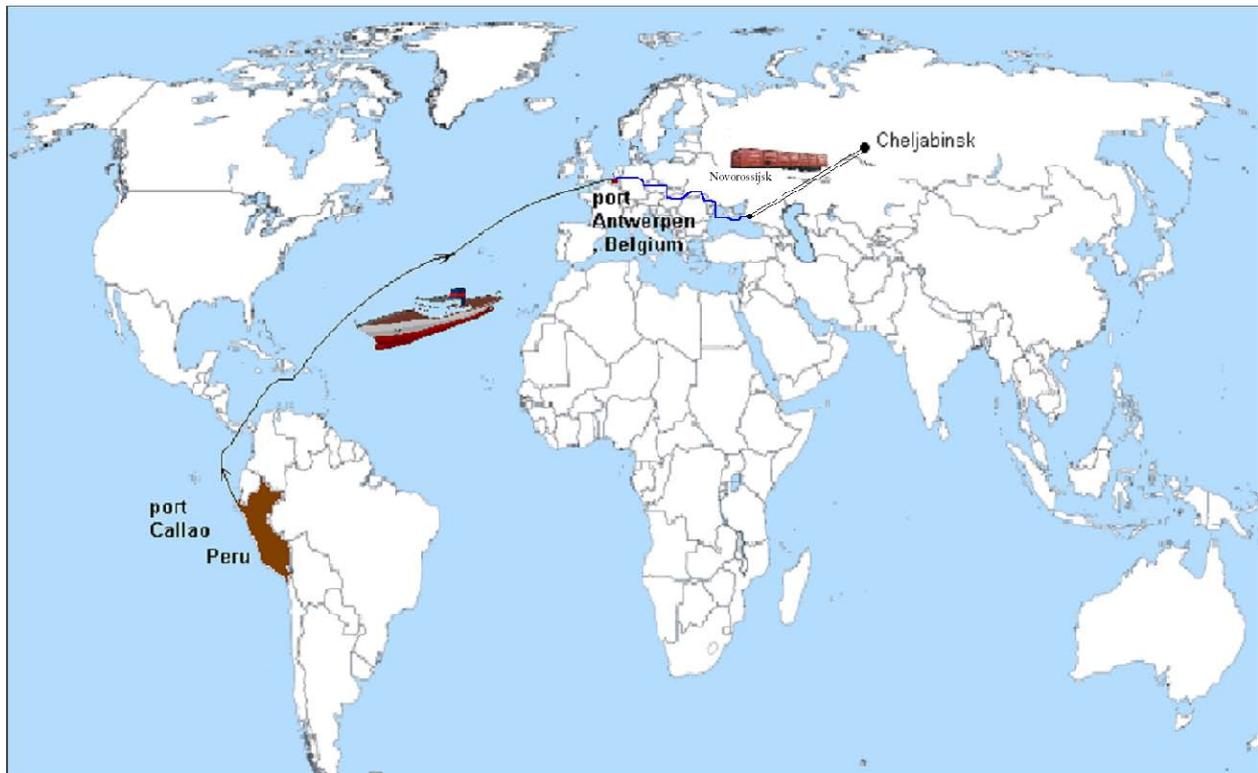
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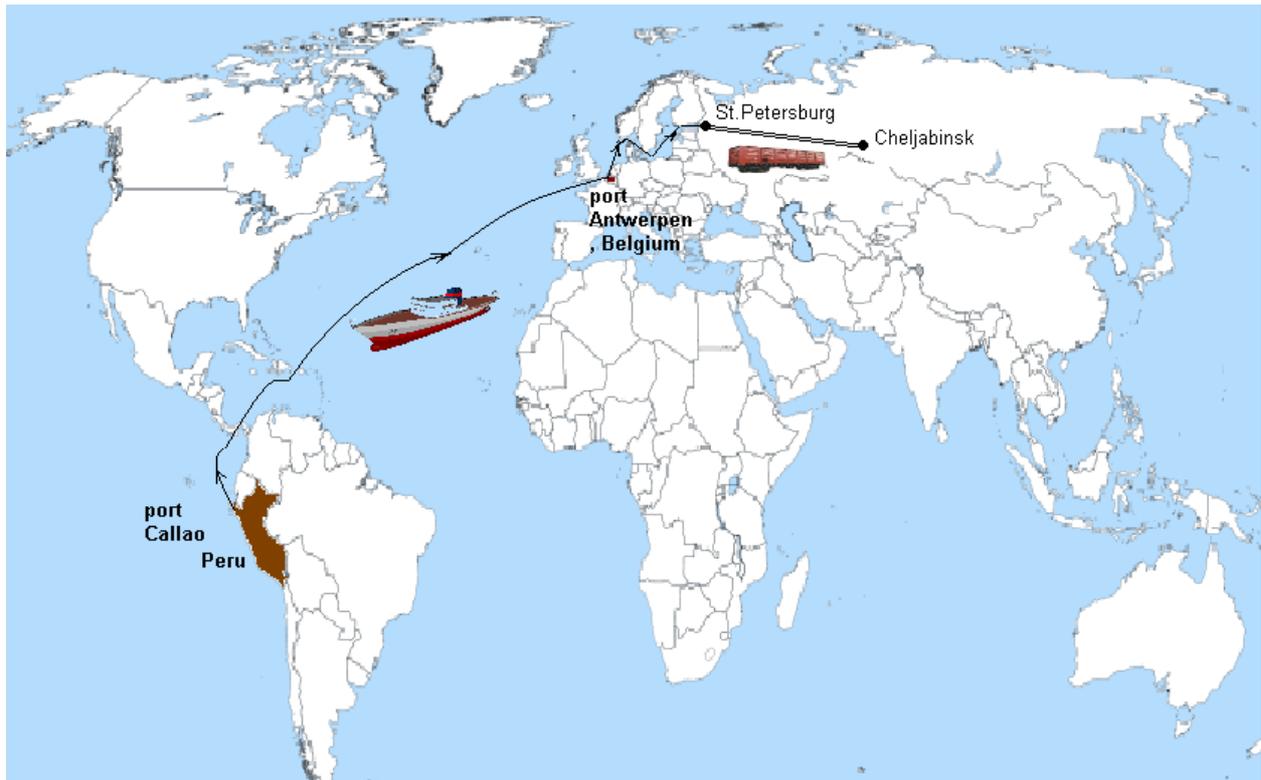
## APPENDIX 1. Basic route of transportation

Port of Peru, Callao → Port Antwerpen, Belgium → Port Novorossijsk, Russia  
→ Final destination, Cheljabinsk zink factory.

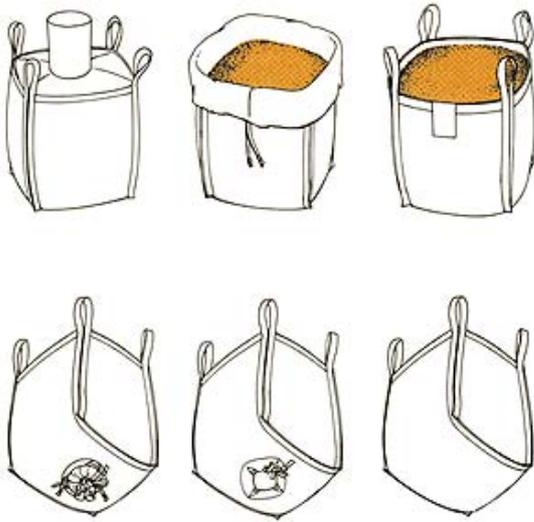


## APPENDIX 2. Alternative route transportation

Port of Peru, Callao → Port Antwerpen, Belgium → Port St.Petersburg, Russia  
→ Final destination, Cheljabinsk zink factory.



### APPENDIX 3. Big bags transportation



(SACOS NOVOA, 2010)

## APPENDIX 4. Transporting the goods in big bags



(Sulpro Industries Inc., 2010)

