

Security in Logistics

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Abstract: This paper deals with security of logistic chains according to incorrect declaration of transported goods, fraudulent transport and forwarding companies and possible threats caused by political influences. The main goal of this paper is to highlight possible logistic costs increase due to these fraudulent threats. An analysis of technological processes will be provided, an increase of these times considering the possible threats which will be evaluated economic costs-wise. In the conclusion, possible threat of companies` efficiency in logistics due to the costs`, means of transport and human resources` increase will be pointed out.

Keywords: Safety, Transport process, Risk, Supply Chain, Carrier

1. Introduction

The fast growth and development of hi-tech technologies in the 90's brought besides boom of many industries also many threats [1]. These technologies are more often theft [2]. The reaction to this trend was the establishment of association **TAPA-EMEA** (The Technology Asset Protection Association Europe). The goal of this association is to solve this problem together with other carriers, forwarders, and producers of hi-tech technologies.

The members of the association are sharing information and are looking for an optimal solution to a problematic situation. The association established a certification **FSR (Freight Security Requirements)**. For whose acquisition many conditions and security standards must be met.

Each subject must secure maximal level of security. By observing the principles of **TAPA-EMEA** and fulfilling the conditions of certification are by guaranteed verified business subjects the security of the transport and warehousing with minimal risk anywhere in the world.

Before entering into a contract the carrier (forwarder) must submit to the customer the copy of its safety politics and plan of transportation and warehousing safety. The copy of safety procedures with relation to the customer's goods must be submitted for evaluation. Also, supplier's safety procedures mustn't be in conflict with FSR conditions. With all documents related to a transport will be treated as confidential.

All places where manipulation with customer's property (goods) takes place, e.g. from the vehicle to the warehouse and back or inside the warehouse are risk points. Provider of transportation services must ensure that all technological and physical processes are properly described and communicated to the customer. The customer must be informed about any deviation from previous processes.

The requirements for vehicle's security (**TSR – Trucking Security Requirements**) were prepared by members of TAPA and passed by all TAPA customers all around the world. The TSR can be used together with other TAPA security requirements for single goods. The TSR set a minimal security standard along the supply chain focus on transportation services and processes. The aim of TAPA members is to secure such transport service provider, which meets at least TSR requirements. The successful implementation of the TSR requirements depends on compliance between providers and its agents. The safety and security of customer's property are in charge of the carrier or forwarder all along the transport. The TSR conditions are stated in each contract. If there is signed a contract without implemented TSR conditions, then it is understood as a fundamental breach of contract.

For the secure of the safety of goods in the international transport are necessary different options of the insurance. The loss, destruction or damage to goods frequently occur during the transport

of the shipment [3]. Traditional risk management tools, such as insurance, must be incorporated into the process of selecting suitable supplier [4]. Damages on shipments guilt by carriers in land transport carriers are claimed according to the international regulations [5, 6].

2. Security of logistic chains

The share of road cargo transport is growing in past year. This trend is in the Czech Republic and in other EU member states as well. The ratio of transport output (tkm) between road and railroad transport is in EU 5,5:1. The Czech Republic has a better ratio in transport output 2,5:1. The disadvantage of the Czech Republic is, that the share of railroad transport fall between 1995 and 2014 from 39,3 % to 24,2 %. This is represented by transport output 22,62 bil. tkm in 1995 and 14,86 bil. tkm in 2014 [7]. Therefore, transport risks are related more to road transport, but we cannot say that railroad transport is free of the risks.

Risks in road transport can be divided into following groups:

- a) Political risks – are caused by the complicated international situation, armed conflicts, movements of migrants from the affected areas to stabilized areas, splitting the EU and the threat of disintegration of the Schengen area, announced sanctions against certain countries (e.g. Russia) etc. Enforcement of the minimum wage in some states of the EU [(Germany (Milog), France (Loi Macron), Austria (collective agreement), Nordic Countries)] can increase costs of business entities in road transport and threaten the competitiveness of road transport. A similar increase of costs would bring a ban of spending weekly rest period in the truck cabin. This is considered in Belgium and France. Also, activities around „driver’s mandatory return home“ will increase costs of road transport. That has a side effect in the increase of need for drivers.
- b) Economic risks – are caused by economic cycles, lack of drivers or dishonest competitive. The largest impact on the economics of transport companies had the economic crisis in 2009 and 2010. Last two year and in the contrary characterized by economic growth,

cheap crude oil, currency intervention and low inflation. Unlucky lower running costs are not reflected in lower prices. With the lack of drivers are problems in all European countries. The quality of drivers is tight with the quality of the company. This is followed by a growth of wage. The side effect of the dishonest competitiveness is in breaking the rules, transport and safety flows, running without all licenses and documents or breaking the rules of cabotage.

c) Operational risks – are characterized by inconsistent interpretation of legislation, supervising authorities of EU have inconsistent interpretation of standards (e.g. Germany, Austria, Poland, Italy, Spain, Belgium of France), documents in the vehicle (poorly filled CMR documents [5], original of Trade Certificate), problems with technical condition of the vehicle (forced withdrawal, mandated service). The lack of accurate information (about driving ban periods, fees and tolls, weight limits [8], special conditions [9] and so on) have an effect on delay. The delay increases direct costs and it's a cause of financial penalties for late delivery of goods. The operating conditions like bad conditions of railway infrastructure cause wear of the rolling stock and accidents. That is directly expressed in running costs. Bad coordination of road closures, reduced capacity of bridges, lack of parking areas with technical equipment are increasing running costs, especially fuel [10-13].

It's clear that all risks have an effect in the increase of the technological and delivery times, together with the increase of the total cost of road haulers. For example, the lack of information related to waiting times and delays at the border outside the Schengen area, or delays during the loading of goods or other unannounced obstacles on the road are increasing the overall cost and technological times or driving times up to 20 %.

3. The Authorisation flowchart

The process before beginning of the transport can be expressed in the following flowchart (Figure 1). Under the flowchart is a description of the whole process.

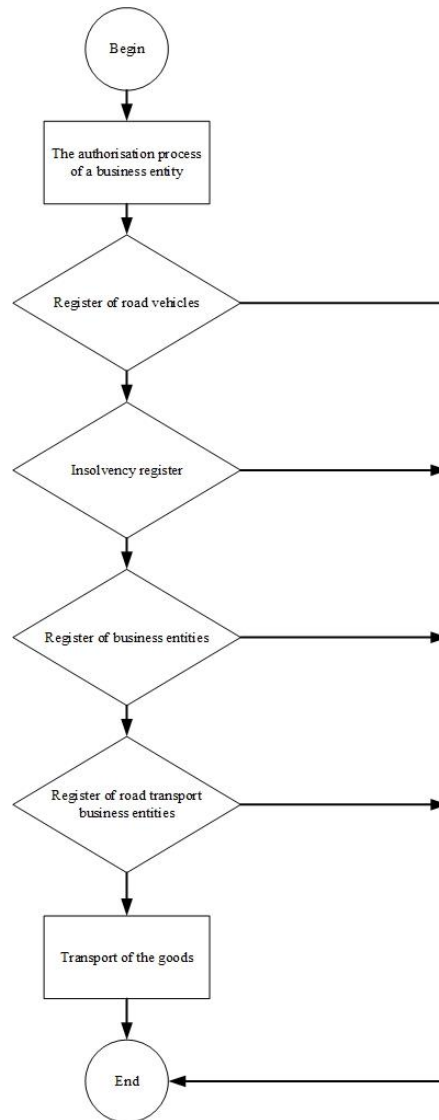


Figure 1: The flowchart of authorization

The first step in the process is a check of the business entity which offers transportation services. This check of the business entity can be done via identification number or via the name of the entity of registration number of the vehicle. Then there are four decision blocks.

The suspicion on bad (invalid) register number can be validated via the Central Vehicle Register. The suspicion on insolvency can be checked by the Central Register of Debtors. The suspicion on invalid information about a business entity can be verified via the Register of business entities. The suspicion on the deceptive business entity in road transport can be verified via the Identification Number of Organization. If we go thru the flowchart only in the vertical

direction than is the business entity authorized for the transport. The proposed information system is simple, user-friendly and cooperates with existing registers.

For safe transport of goods to the delivery place is necessary cooperation of all segments of the logistic chain:

- Information about the goods,
- suitable packaging,
- qualified loading staff,
- right and suitable transport mean,
- load distribution on the loading area,
- right use of lashing points and binding instruments,
- right place of delivery.

It is a coordination of qualified and high competence activities of workers on the manufacturer's side, sender's side and during the manipulation (loading, unloading, reloading) and on the side of the hauler as well.

Goods on the loading area of the vehicle must be evenly distributed and properly secured by appropriate properties according to ČSN EN 12195-2, ČSN EN 12195-3, ČSN EN 12195-43.

A right number of binding and lashing properties must correspond with ČSN EN 12195-13.

To prevent the access to the loading area there is used a combination of mechanical and electronic safety barriers (seals). Those systems are securing:

- active tracking of the goods in a real time (online),
- immediate activation of the emergency signal in case of mechanical barriers or seals,
- finding objects on large areas,
- online control of cargo properties (temperature, speed, tilt and so on),
- interconnection with other systems like GSM, GPRS, RFID – towards the customer's dispatching,

- security services.

Another problem of the logistic process is a bad or insufficient declaration of goods in documents. A classic example of those cases is a false declaration of goods due to paying of lower taxes as excise duty (petroleum oil labeled as heating oil, drinking alcohol declared as denatured alcohol). Secondary there is also cheaper transport because those products are transported under normal conditions instead of special conditions. The state must pay special attention in fraud of taxes. During inspections must be compared really loaded goods and declaration in documents. The mismatches can be checked by RFID or any other technology.

4. Fraudulent Transports

The safety transport is affected by volume and well-timing of information about material property (chemical, physical, economical, etc.), correct packaging (protection of goods, transport conditions), well qualified loading personnel, suitable transport mean, right stowage in the vehicle or on the vehicle, accurate information about the place of delivery [11].

The risks with choosing of the business entity in the logistic chain are: (carrier, forwarder, sender, recipient, and agent):

- a) the limited possibilities of obtaining information about new business entities,
- b) the requirement for quick evaluation or approval process of the new entity,
- c) verification of the identity of the new entity is time-consuming,
- d) customer losses control over the movement of goods at the time of loading,
- e) telephone communications between trading partners are unenforceable,
- f) database of reliable entities
- g) tracking of the consignment with current position and state,
- h) demonstrable communication with stakeholders via an information system with a recording device.

Safer control of business entities involved in the logistic chain would be possible after implementation of information system, which would have a link to following existing registers:

- a) registry of business entities in road transport,
- b) registry of road vehicles (check of the registration number),
- c) a public registry of business entities,
- d) insolvency register.

The question on the business subject would check relevant information about its existence, solvency, if the registration number is valid and who is the owner of the vehicle. A number of fraudulent transports are in the Table 1.

Table 1: Development of fraudulent transports between 2010 and 2016

Year	2010	2011	2012	2013	2014	2015	2016
Number of cases	100	60	58	50	44	24	5 ¹

Source: Police of the Czech Republic

Safety measures to prevent fraud cases in the logistics chain:

- a) a consistent check of road vehicles on the input (entrance), checking of locks and seals, control of packaging, control of the vehicle including floor and roof, control of the intermodal unit,
- b) a consistent check of driver's ID card, documents, and CMR list,
- c) checking the proper packaging and "sealing" of pallets and logistic units,
- d) fleet management and GPS monitoring during the transport (security dispatching),
- e) the possibility of escorting (accompaniment) of the road vehicle in case of transportation of goods with high value,
- f) usage of safety parking areas,
- g) central shared surveillance of large logistics centers,
- h) mobile services combined with security doors, CCTV, attendance systems and so on.

¹ Cases until the end of May 2016

5. Discussion

The decrease of fraud cases is due to increased information of business entities involved, but also in the fact that criminals are moving to other countries (new market without control). Logistics chains with the fast flow of goods are the most threatened by political risks. Unclear outlook, coupled with high migration of people from the Middle East threatens the strategic decisions of enterprises in the transport sector with the uncertainty of business restrictions caused by border checks. This is the biggest threat that would have slowed the flow of goods and raise additional costs associated with the acquisition of trucks and deepened the problem with the lack of qualified drivers.

6. Conclusion

The theft or robbery may not be always unavoidable circumstances for damages. As an example author's use the transport of textile from Prague to Roma. The carrier got dispositions that in the case of late arrival the driver has an obligation to park the vehicle at the petrol station or on the lighted parking area because in Italy are frequent thefts. Especially on the route Roma – Napoli and Bari (Bermuda triangle). Due to the speed restrictions and the traffic controls the delay has occurred. Transport was ensured by two drivers. They parked near the barracks. They were assaulted, the shipment was stolen.

The Court of Arbitration disagreed with the decision of the Court of Appeal that each robbery is an unavoidable circumstance. The case wasn't stated as a liberation cause. The Court Decision was: Park always on the safe place, arrange driving to avoid the delay, one driver should stay in the vehicle.

The next example (case) is a false carrier. The Czech carrier entered into a contract with a customer for transport of goods. Due to lack of vehicles wasn't used own vehicle, but the transport was offered via server www.RaalTrans.cz to a carrier from Slovakia. After the establishment of the contract, the Slovakian carrier disappeared with the consignment. The

customer claimed on the Czech carrier damage according to article 29 CMR. The Czech carrier doesn't have the insurance contract with coverage of this risk. Therefore he must pay all the damage.

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