

MULTIMODAL DANGEROUS CARGO TRANSPORTATION PROCESS IN TURKEY: CATCHING EUROPEAN UNION STANDARDS¹³

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ÖZET: Bu çalışma Avrupa Birliğı tehlikeli madde taşımacılığına ilişkin düzenlemeler ve IMDG code ile ilişkisini ele alarak Türkiye'nin ihracat ve ithalat aktivitelerine etkilerini konu alır. Küresel ortamda Türkiye'nin ticari aktiviteleri düşünüldüğünde, deniz yolu taşımacılığı en önemli taşıma modu olarak gösterilmektedir ki bunu takiben karayolu taşımacılığı gelmektedir. Avrupa Birliğı ülkeleri ile Türkiye arasında gerçekleştirilen tehlikeli madde taşımacılığında ve özellikle çok modlu taşımalarda en önemli düzenlemeler Tehlikeli Mallar Uluslararası Denizcilik Kodu(IMDG) ve Karayolu ile Uluslararası Tehlikeli Madde Taşıma ile ilgili Avrupa Antlaşması (ADR)'dir.

Tehlikeli Mallar Uluslararası Denizcilik Kodu tehlikeli madde taşımacılığına ilişkin usulleri, çevre kirliliğini engelleyerek güvenli taşımacılığın gerçekleştirilmesini amaçlar. Karayolu ile Uluslararası Tehlikeli Madde Taşıma ile ilgili Avrupa Antlaşması ise tehlikeli maddelerin karayolu ile taşınması usullerini düzenler. Bu iki koda ek olarak diğery taşıma modlarında kullanılmak üzere düzenlemeler bulunmakta olup örneğın iç suyuolları taşımacılığında İçsuyolları Vasıtasıyla Uluslararası Tehlike Madde Taşıma ile ilgili Avrupa anlaşması (AND) ve demiryolu taşımacılığında Demiryolları aracılığıyla Uluslararası Tehlikeli Madde taşıma anlaşması(RID) kullanılmaktadır. Yukarıda bahsedilen tüm anlaşmalar ortak amaçları kapsamakta olup farklı taşıma modlarında kullanılmaktadır.

Avrupa birliğı ülkelerine tehlikeli madde taşımacılığı yapan Türkiye gibi ülkeler çok modlu taşımacılık sırasında ADR ve IMDG anlaşmalarını takip etmek zorundadır. Bunun yanı sıra bazı durumlarda transit ülkelerdeki farklı tehlikeli madde uygulamaları da ayrıca uygulanmaktadır. Tehlikeli madde taşımacılığı oldukça riskli ve insanlar ve doğaya zarar verilmemesi adına dikkat gerektirmektedir. Aynı ulaşım sürecinde farklı uygulamaların takip edilmesi ise tehlikeli madde taşıma sürecini daha karmaşık bir hale getirmektedir.

Bu çalışmada Türkiye'den Avrupa Birliğı ülkelerine gerçekleştirilen tehlikeli madde taşımacılığı önündeki engeller incelenerek mevcut düzenlemelerin basitleştirilmesi ve taşıma modları altyapı, ulaşım maliyetleri ve eğitim süreçleri gibi alanlardaki farkların azaltılarak Avrupa Birliğı standartlarının nasıl sağlanacağı incelenmektedir.

Anahtar Kelimeler: Tehlikeli madde taşımacılığı, multimodal taşımacılık, Avrupa Birliğı taşımacılık düzenlemeleri

MULTIMODAL DANGEROUS CARGO TRANSPORTATION PROCESS IN TURKEY: CATCHING EUROPEAN UNION STANDARDS

ABSTRACT: This study investigated European Union dangerous goods transportation regulations and their affects on Turkey's export and import activities in respect to the IMDG, International

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Maritime Dangerous Goods transportation regulations. Considering Turkey's trade activities in global area, sea transportation is the most important transportation mode which is followed by road transportation. Dangerous goods trade between European Union countries and Turkey, especially in the multimodal transportation; there are two important key regulations at once, IMDG, ADR, European Agreement concerning the International Carriage of Dangerous Goods by road.

International Maritime Dangerous Goods Code is a regulation of dangerous goods transportation which aims safe transportation through protecting environment. ADR regulates dangerous goods transportation by road. In addition to IMDG and ADR codes there are different regulations for other modes such as railway and inland waterways. ADN is the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways. RID are the Regulations concerning the International Carriage of Dangerous Goods by Rail. All of these regulations have common purposes but related with different types of transportation modes.

Countries; have dangerous cargo transportation to European Union like Turkey have to follow ADR and IMDG codes during multimodal transportation process. Besides using two different regulations in same time, in some cases dangerous cargo transporter needs to follow transit countries regulations. Dangerous cargo transportation is already risky and required key importance to not harm people or environment. Following different regulations in same transportation process makes dangerous cargo transportation more complicated.

In this study we will try to examine how we reduce the barriers against dangerous cargo transportation from Turkey to European Union countries with try to simplify regulations between transportation modes and reducing differences about basic issues like dangerous cargo training process, infrastructure and transportation costs between European countries and Turkey to catch EU transportation standards.

Key Words: Dangerous cargo transportation, multimodal transportation, European Union transportation regulations

INTRODUCTION

Many countries all over the world; has import or export activities of dangerous goods transportation by using seaway, road, railway or inland waterways in order to related conventions such as SOLAS, ADR, RID or United Nations hazardous cargo transportation codes. However all these conventions only focus on single transportation mode. In this search we will look in more complicated perspective of multimodal transportation on International basis with trying to examine affects on Turkish export and import activities.

First of all we need to determine dangerous goods as key material for this study. Dangerous Goods are substances and materials that could mean danger for the public safety, public policy, particularly for the general public, for important public property, for life and health of human beings, animals and property based on their nature, quality characteristics and in connection with their forwarding. The definition of forwarding includes the transport, but also packing and unpacking, loading and unloading and the short-term interim storage of goods (Gusik, 2012).

After determination of dangerous substances, second important key subject is international multimodal transportation for this study. "International multi modal transport means the carriage of goods by at least two different modes of transport on the basis of a multimodal transport contract from a place in one country at which the goods are taken in charge by the

multi modal transport operator to a place designated for delivery situated in a different country” (United Nations, 1981). As it understood from United Nations multimodal transportation definition, multimodal transportation operations are already harder than single modes because of its complex nature. Organization and operation process has key importance connecting one mode with another. Thinking dangerous cargo trading operations over multimodal transportation; everybody should care two more times than standard single modal transportation of general cargoes for not to cause any injury or damage.

The international transport of hazardous goods and waste is connected to the various modes of transport that are used (by road, rail, sea, inland navigation and by air), with the problems connected to the intrinsic safety of the transport means and therefore of the material that is transported, the safety of the workers and of the third parties that use the means of transport. Problems related to safety and the environment, as well as economic consequences, can emerge during any stage of international transport, from the loading of the goods or wastes to the intermediate stopovers, from the possible stops to the final unloading of the goods or waste. These complex international transport operations, whether single or multimodal and whether related to hazardous goods or hazardous waste, are regulated at an international level by the UN, from a general point of view and, as far as the five means of transport are concerned, by the same number of international agreements. (Giancarlo Carosso, *The International Multimodal Transport Of Hazardous Goods And Waste*, 2012)

Last thirty years international trade became more easier with technological developments but arises in global competition forces companies to find new solutions for best transportation and logistics services. World leading transportation and logistics companies are offering additional services and developing new strategies to win the great competition day by day. At the present time, by transportation and logistics services improve; exporters, importers, production facilities, warehouses or who else in dangerous cargo business have to use multimodal transportation for providing best service to their clients which means at least two transportation modes required in one contract.

Speaking of improved service quality in transportation and logistics, dangerous cargo transportation is different profession with distinctive regulations and characteristics of goods. This is why all parties who are involved in should have knowledge of regulations about dangerous cargo transportation process to provide safe and quality services to their clients. In chapter 1 we will try to explain international dangerous cargo transportation regulations and in last chapter we will look multimodal dangerous cargo transportation from perspective of Turkey with trying to find out regarding problems.

INTERNATIONALLY ACCEPTED CONVENTIONS FOR DANGEROUS CARGO TRANSPORTATION

1.1. International Maritime Dangerous Goods Code

As noted earlier, dangerous cargo transportation regulated all over the world with conventions. Most widely accepted regulation is IMDG code has been developed by International Maritime organization. As a specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented. (International Maritime Organization, 2016). IMO also developed other conventions related with safety, security issues and prevention for marine pollution, one of those conventions is SOLAS, Safety of Life at Sea is a convention to regulate safety issues at sea and then IMDG code developed as supplement of SOLAS.

As supplementary of SOLAS, IMDG is a dangerous goods transportation code by sea and has function of classified hazardous materials into nine classes. These classes are explosives, gases, flammable liquids, flammable solids, Oxidizing substances and organic peroxides, Toxic and infectious substances, Radioactive materials, Corrosive substances and Miscellaneous dangerous substances. Also IMDG list covers all hazardous materials in table shows UN number, proper shipping name, class or division, subsidiary risk, packing group, special provisions and etc. IMDG code provides handling information for parties who involved in dangerous cargo business from loading operation to discharging. Turkey as member of International Maritime Organization has to follow IMDG code during dangerous cargo transportation by sea.

Turkey has accepted IMDG code as supplementary of SOLAS and became mandatory since 1st January of 2004.

1.2. General overview of EU countries dangerous cargo transportation regulations

ADR is developed by UNECE Inland Transport Committee in 1957 at Geneva to improve safety standards in road transportation of dangerous substances and protecting environment. As all other transportation codes and regulations main target is reducing accident rates and prevent life loses at road transportation. In Europe alone, the annual total cost of road accidents amounts to more than 160 billion Euros, which is the equivalent of 2% of Europe's GNP. Moreover, not only financial costs are a daily bother, numerous deaths and injuries add to an intolerable social cost (Evangelos Bekiaris, 2011).

ADR not only regulates dangerous cargo transportation by road also determine responsibilities of all parties from producer to receiver during transportation process. Turkey has signed ADR convention in 2010 and code has become mandatory since 1st January 2014.

The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) was done at Geneva on 26 May 2000 on the occasion of a Diplomatic Conference held under the joint auspices of the United Nations Economic

Commission for Europe (UNECE) and the Central Commission for the Navigation of the Rhine (CCNR). It entered into force on 29 February 2008.(UNECE). ADN regulates dangerous cargo transportation by inland waterways with aims to high level of safety, prevent pollution, damage or injury.

Regulations concerning the International Carriage of Dangerous Goods by Rail(RID), is regulates dangerous cargo transportation by rail with aims to complete safety issues regarding Regulations concerning the International Carriage of Dangerous Goods by Rail(COTIF). Turkey is a member state of COTIF since 1985.

1.3. UN Recommendations on the Transport of Dangerous Goods

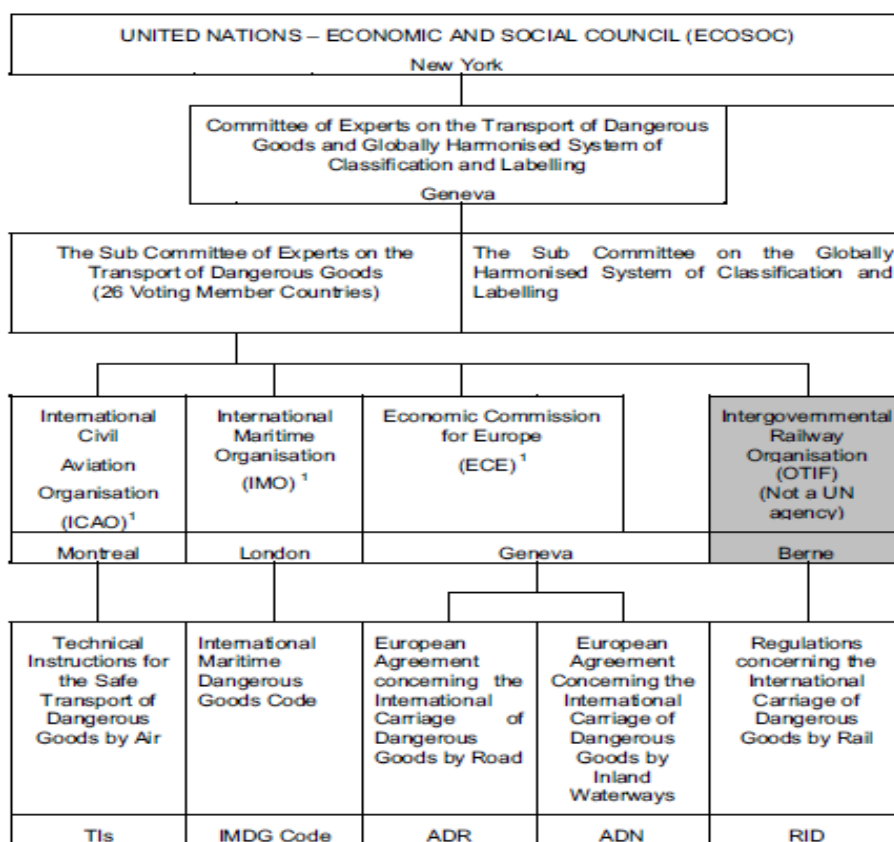
The UN Recommendations on the Transport of Dangerous Goods-Model Regulations have been developed by the United Nations Economic and Social Council's (UN ECOSOC) Committee of Experts on the Transport of Dangerous Goods (TGD) in the light of technical progress, the advent of new substances and materials, the exigencies of modern transport systems and, above all, the requirement to ensure the safety of people, property and the environment (Giancarlo Carosso, The International Multimodal Transport Of Hazardous Goods And Waste, 2012)

The UN Recommendations on the Transport of Dangerous Goods are contained in the UN Model Regulations prepared by the Committee of Experts on the Transport of Dangerous Goods of the United Nations Economic and Social Council (ECOSOC). They cover the transport of dangerous goods by all modes of transport except by bulk tanker. They are not obligatory or legally binding on individual countries, but have gained a wide degree of international acceptance: they form the basis of several international agreements and many national laws.(Wikipedia , 2016)

1.4. Globally Harmonized System of Classification and Labeling of Chemicals(GHS)

Globally Harmonized System of Classification and Labeling of Chemicals (GHS), addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals is available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals. The GHS also provides a basis for harmonization of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.(United Nations Economic Commission for Europe, 2016)

Picture 1: Basic United Nations Dangerous Good Transport Structure (Evaluation of EU Policy on the Transport of Dangerous Goods since 1994, 2005)



¹ These agencies have ECOSOC as their parent body. This diagram shows how dangerous goods regulations are sent to the different agencies.

2. DANGEROUS CARGO TRANSPORTATION IN TURKEY

Considering international trade and economical relations, Turkey has advantages in global area because of its strategic positioning as a function of bridge between European and Asian countries. In addition to unique position, technological and economical developments provide Turkey to take a place in global trade arena with efficient production facilities, quality products and strong relationships with world leading countries. Especially in last decade Turkey’s production capacity has been increased in almost every business sector and economical developments increased demand for international transportation activities as derived demand.

When analyzed Turkey's foreign trade capacity according to Turkish statistical institute export data's of the year 2015, Turkey's total export to European countries covered % 44, 5 of total export. Hence there is a limitation for dangerous goods trade statistics for find out trade rates we all know dangerous cargo producing and transporting activities have remarkable capacity in Turkey.

Table 1: Turkey exports by country group and year, share in total (%) (Turkish Statistical Institution)

Exports by country group and year, share in total (%)										
Country groups	Share (%)									
	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total	100	100	100	100	100	100	100	100	100	100
A-European Union (EU 28)	44,5	43,5	41,5	39,0	46,4	46,5	46,2	48,3	56,6	56,3
B-Free Zones in Turkey	1,3	1,4	1,6	1,5	1,9	1,8	1,9	2,3	2,7	3,5
C-Other countries	54,2	55,1	56,9	59,5	51,7	51,7	51,8	49,5	40,6	40,2
1-Other European Countries	9,8	9,6	9,4	9,3	9,4	9,8	10,9	11,6	9,8	9,1
2-North African Countries	5,9	6,2	6,6	6,2	5,0	6,2	7,3	4,4	3,8	3,6
3-Other African Countries	2,7	2,5	2,7	2,6	2,7	2,0	2,7	2,4	1,8	1,7
4-North American Countries	4,9	4,6	4,3	4,4	4,0	3,7	3,5	3,6	4,2	6,4
5-Central America and Caraipts	0,6	0,6	0,7	0,5	0,5	0,5	0,6	0,6	0,5	0,6
6-South American Countries	0,9	1,2	1,4	1,4	1,4	1,1	0,7	0,7	0,5	0,4
7-Near and Middle Eastern	21,6	22,5	23,4	27,8	20,7	20,5	18,8	19,3	14,1	13,2
8-Other Asian Countries	7,2	7,4	7,9	6,9	7,6	7,5	6,6	5,4	4,9	4,6
9-Australia and New Zealand	0,4	0,4	0,4	0,3	0,4	0,4	0,4	0,3	0,3	0,4
10-Other Countries	0,1	0,1	0,1	0,1	0,1	0,1	0,5	1,1	0,8	0,2

To provide sustainable development of foreign trade between European Union countries Turkey needs to complete standards of dangerous cargo transportation regulations for all transportation modes.

Dangerous cargo transportation regulated in Turkey by Ministry of Transport, Maritime Affairs and Communications based on internationally agreed dangerous cargo transportation codes. As stated previously during different modes of transportation of hazardous materials, Turkey has to follow related regulations.

Table 2: Internationally agreed dangerous cargo transportation regulations followed by Turkey.

Seaway	IMO / IMDG code
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Road	UNECE /ADR
Railway	OCTI /RID
Inland Waterways	ADNR /ADN
Air	IATA-DGR

Despite of these regulations are mandatory; in Turkey there are still some deficiencies need to overcome especially in process of multimodal transportation. In next chapter we will try to define dangerous cargo transportation problems in Turkey with understanding reasons.

RESULTS AND DISCUSSION

As we discuss in introduction part of this study, multimodal transportation in Turkey has difficulties related with different conventions implementation, training deficiencies, unconsciousness for dangerous cargoes, risk evaluation and infrastructure inadequacies.

When analyzed dangerous goods export and import process from production to delivering end-user every interested party should be aware of level of risks carry out. First step is starting with production process and it is very important that producing company should define their product risks and dangers for human life and environment in case of emergency. The best way to identify product, producing company should prepare SDS, Safety Data Sheet form to show all properties of dangerous substances and provide first aid tips in case of injury. Also SDS provides proper knowledge about goods to control next steps of process like packaging or loading unloading steps. If SDS provides wrong or missing information it can be cause to further injuries or damages.

In addition to SDS form also all other cargo documentation should be prepared rigorously without missing any information. Employees who work in dangerous cargo producing, trading or transporting company should have training related with their department. For instance export specialist who is responsible about export documentation and customer relationships should be aware of importance of cargo documentation process and related documents and also should answer questions related with producing and packaging process. Also other operational workers should have knowledge about producing and operation process to provide proper handling operation and understand possible errors in case of any problem occurs.

Turkish companies who in dangerous cargo business; should provide general awareness training for all employees according to Ministry of Transport, Maritime Affairs and Communications regulations. During the lesson authorities provide basic knowledge about dangerous cargo, classification, possible accidents, damages, and current regulations. However general awareness training is not comprehensive to raise awareness for all employees because all hazardous substances have unique characteristics with special handling instructions. Also generally producing companies produce certain products and training safety

advisors should have knowledge of material properties handling packaging and first aid instructions before training starts.

Another issue that needs to overcome is companies trying to find ways to avoid proper handling and operation process because of transportation costs are higher than regular cargo, transport prohibited cargoes, to avoid inspection process, not to lose time or money for more profit. Also some dangerous cargoes subject to special transit regulations and only allowed to follows certain routes and entering certain ports. Also lack of controlling points, unconsciousness of related parties cause accidents and harms to human life and environment. But if control points, punishments and sanctions increase, it will be disincentive factor for companies.

Final preventing factor for catching European Union standards related parties like fire department and police or other teams who should have responsibilities to respond, should have knowledge about dangerous cargoes first aid and proper responses instructions. Especially fire department officers training is very important to give a right response not cause more damages to human life and environment.

CONCLUSION

For complete all requirements at European standards, we need to increase trainings for dangerous cargo employees and government might set online advice services about dangerous cargo transportation for producing and trading companies which helps employees to take advice from advisors in any minute about loading/discharging operations, cargo packaging, labeling and chemical substances advice. Also might set a emergency advice services for accidents and police or fire department should work directly with this safety advisors for response to dangerous cargo transportation accidents right.

Another shortcoming is as main reasons for most of accidents are company authorities trying to avoid dangerous cargo transportation responsibilities for transporting prohibited cargoes, special requirements for dangerous cargoes which only allowed handling operations in certain ports and routes. Those accidents can be prevented via increasing penalties and sanctions to companies who is responsible of harms and injuries.

In conclusion if mentioned deficiencies overcome with more training and controlling Turkey can reach European Union standards with increasing export and import rates. Also accident rates and harms to human life and environment can be reduced.

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