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## Investigation of ADR Agreement in terms of Management Accounting

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### Abstract

International regulations are important for businesses which are operating internationally. In this study, The European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR Agreement) which is a regulation about dangerous goods, is evaluated. Union Number's of dangerous goods (UN) 1005, one of example dangerous goods "Ammonia" was investigated in terms of ADR Agreement. This study, where management accounting and the ADR Agreement coexist, is a multidisciplinary paper. As a result, if the operator does not comply with the ADR Agreement, the amount of penalties to be paid and the losses and losses of internationally violated commercial agreements are more than the additional costs incurred in accordance with the agreement of the relevant operator. A business manager operating in the industry related to the dangerous goods should decide on the costs of the ADR Agreement. It is also important in terms of social responsibility and sustainability of the business (sustainable environmentalist production) among the basic accounting concepts for the concerned enterprises implementing the agreement provisions, since the ADR Agreement is a regulation designed to prevent harm to the environment and human beings.

**Keywords:** *ADR, ADR agreement, dangerous goods, management accounting*

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### 1. INTRODUCTION

The fact that businesses operate in a healthy way depends on the fact that different units in the business operate in coordination. In order to apply the agreed standards in an ADR Accredited Business, the relevant enterprise must obtain the Dangerous Goods Safety Advisor (DGSA) service. For this reason, DGSA should work in coordination with the accounting department in charge of operation and in the communication with the Department of Foreign Trade, especially since the ADR Agreement is an international regulation. This harmonization and coordination between the departments is provided by the manager.





In the study, firstly management accounting is explained conceptually. Secondly, The ADR Agreement was explained together with fines. For the embodiment of the work, a sample of a dangerous substance named Ammonia was examined by the Dangerous Goods Safety Advisor according to the provisions of the ADR Agreement. A report has been prepared containing the standards to be followed for the sample dangerous goods and evaluated from the management accounting point of view.

## **2. MANAGEMENT ACCOUNTING**

Under this basic heading, the conceptual framework of management accounting and the importance of management accountancy in business have been emphasized. Then ADR Agreement was explained in the study.

### **2.1. Management Accounting Conceptual Framework**

It is possible to define more than one definition for the management account. Management Accounting; summarization and reporting of the financial and non-financial information to be used in the business. (LESLIE G. ELDENBURG, SUSAN K. WOLCOTT, Cost Management: Measuring, monitoring and motivating performance, John Wiley & Sons, can also be defined as the preparation and reporting of financial statements to measure the correct use of resources for planning, evaluation and control in the enterprise. (Sait Y. Kaygusuz and Şükrü Dokur, Management Accounting, Dora Publishing, 2015, p.2) Management accounting is linked to many accounting branches such as bank account, insurance account, construction account, foreign trade account (Kamil Büyükmirza, Cost and Management Accounting *in Turkish*, 11st Press, p. 36-37).

In the light of the definitions in the literature, management accounting is used in the management decision making processes from various accounting specialization branches (cost accounting, general accounting, foreign trade transaction accounting, etc.).

#### **2.1.1. The importance of management accounting in business**

It is also important for businesses to be well governed as well as to follow new technologies so that they can survive and compete. Businesses need management accounting information regardless of whether they are in production or trade or services, small or large business class. The main duty of the managers at this point is that their businesses can analyze their financial data correctly and make the right decisions at the right time.

Managers play an important role in determining the goals of businesses. Identifying targets that are too far away to identify goals will leave the business in a difficult situation in the future. Or when managers determine their business objectives, they set targets far below their current status, and at this point they can fall into a business position that is difficult to survive against their competitors. At this point, it is important to determine the business objectives of financial information prepared through management accounting.

Managers must play an effective role in determining suppliers, have the ability to intervene in any adverse situation or glitch that may occur in the production process in the business, or to prevent any negativity that can be experienced among employees. Through the prepared reports, it is possible for the operator to determine in which department the failure has occurred and to be able to intervene without delay.





Managers are also important at the same time to control the process and control whether deviations from the planned targets are experienced. (Ertuğrul Çetiner, Management Accounting, Gazi Publications, 2008, p.22-24)

It is important for businesses to be able to accurately determine the various calculations used in decision making and the cost information within these calculations. The ability to transfer cost information correctly to financial statements and the resulting financial statements are important for many segments. At this point, financial statements are important so that managers can make the right decisions and make a sound situation analysis before making a decision.

In the enterprises, management accounting information is required in order to produce various kinds of cost information of the said product or to purchase it from the suppliers in the form of raw material, to make the order production process or to make the decision to purchase or renew the machinery or equipment. (Necmettin Erdoğan and Metin Saban, Cost and Management Accounting, Beta Publications, September 2010, pp. 445-458)

### **3. THE EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE of DANGEROUS GOODS BY ROAD (ADR AGREEMENT)**

The ADR Agreement, the focus point of dangerous goods, is an international regulation by the European Convention Concerning the International Carriage of Dangerous Goods by Road. The organization responsible for the preparation, development and monitoring of this international regulation is the Committee of Experts established within the United Nations. Decisions that this committee, which was formed by the UN, have taken on dangerous goods are published under the name of "United Nations Recommendations (Orange Book)". The UN orange book was first published on the international scene in 1956 (Öncül and Yumuşak, 2006, p.146). The ADR Agreement consists of 7 chapters, Annex A, "General Provisions, Dangerous Goods and Provisions" and Annex B, "Provisions Concerning Transport Equipment and Transport Activities" (United Nations Economic Commission for Europe's Inland Transportation Committee, 2012).

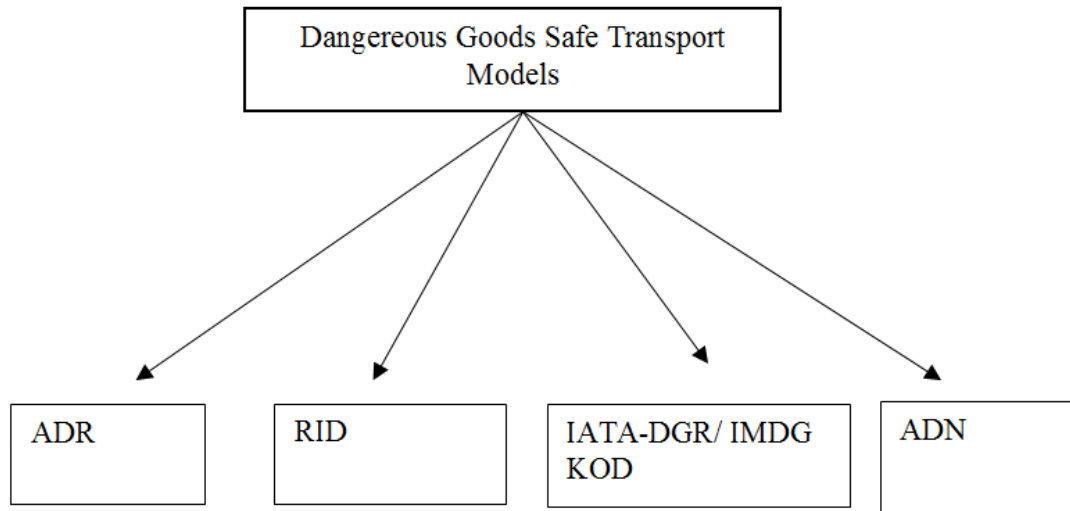
In the chronological order of the international agreements and arrangements for the safe transport of dangerous goods under the auspices of the Union Nation Model Regulations (Aytekin, 2015, p.2):

- The European Convention on the International Carriage of Dangerous Goods by Road in the framework of the United Nations Economic Commission for Europe (ADR) was enacted in Geneva on 30 September 1957 and entered into force on 29 January 1968.
- The provisions of the "Regulations Concerning the International Carriage of Dangerous Goods by Rail" (RID) entered into force on 3 June 1999. 1960 The SOLAS Convention was ratified by the International Maritime Organization (IMO) meeting in 1965 under the SOLAS Convention on 1 January 2004, Hazardous Load Code "(IMDG Code).
- The International Civil Aviation Organization has implemented the provisions of the "Technical Instructions for the Safe Transport of Dangerous Goods by Air" (ICAO-TI) and the "Dangerous Goods Instructions of the International Air Transport Association" (IATA-DGR) in the framework of the international transport of dangerous goods by air.
- The provisions of the "European Convention on the International Carriage of Dangerous Goods by Inland Water" (ADN) for the carriage of dangerous goods by inland water entered into force on 29 February 2008.





Transport in the light of safe logistical movements of dangerous substances can be illustrated schematically as like in Figure 1.



**Figure 1.** Hazardous materials safe transport modes (as created by the authors in line with UN model regulations).

Turkey joined the ADR Agreement on 22 March 2010. In 46 countries out of 48 countries party and began to ADR integration work. The authority responsible for the implementation of the ADR Agreement in Turkey Ministry of Transport, Maritime Affairs and Communications (UDHB) d. UDBH has defined the concept of "ADR" as "the European Agreement on the International Carriage of Dangerous Goods by Road". Although the Turkish translation of the ADR Convention is referred to as road transport, this regulation covers not only transport but also pre- and post-transport activities. Manufacture, packaging, labeling, loading, unloading, storage, etc. of hazardous materials. all stages are a mandatory process to comply with the ADR Accords. Businesses face administrative penalties if they do not comply with the ADR Agreement.

Dangerous goods are identified by four-digit UN (Union Number) numbers determined by the United Nations. As for the dangerous substances with no UN Number, if necessary analysis can be made, UN NO assignment of Dangerous Goods Safety Consultants (DGSC) authorized by UDBH in accordance with the ADR Agreement provisions for the relevant hazardous material.

### 3.1. Classification Dangerous Goods with ADR Agreement

Dangerous goods; environment, and human health during the transportation, handling and storage operations of the hazardous material to the required destination (Karabulut and Öcalan Akünel, 2015, p.351). Accidents in Seveso, Bhopal, Schweizerhalle, Enschede, Toulouse and Buncefield have been experienced due to the hazardous materials that are present, and many of these accidents have suffered a great loss of life due to the high cost of the accidents (Yarpuzlu, 2011, p. Another example of a study involving numerical representations of hazardous material accidents was conducted in the United States. In this study, a total of 15,919 accidents involving dangerous substances in 2013 were investigated. As a result of these accidents, loss of 81,165,866 dollars has come to fruition. Moreover, 54.8% of these accidents were caused by extinguishing liquid, 25.7% toxic gas and 19.5% from other various hazardous substances (Yilmaz et al., 2016, pp. 39-40). The reason for the hazardous substance accidents varies, but most of the accidents that have taken place in the European Economic Community data base are based on human error (Kuncyć et al., 2003, p. In the light of this information, it is understood



from the numerical figures that dangerous substance education is important. First aid, fire extinguishing, etc., for persons other than those involved in dangerous goods, in addition to general community trainings, basic trainings on hazardous items will play a proactive role in terms of accidents and losses.

According to the ADR Agreement, dangerous goods are divided into 9 classes (ADR Agreement, C.I, p.103):

- **Class 1:** Explosive Materials and Objects
- **Class 2:** Gases
- **Class 3:** Flaming Liquids
- **Class 4.1:** Flammable Substances, Self-Induced Material and Reduced Sensitivity Solid Dispersants
- **Class 4.2:** Self-inflammation Material
- **Class 4.3:** Extinguishing Media when Contact with Water
- **Class 5.1:** Upgrade Material
- **Class 5.2:** Organic Peroxides
- **Class 6.1:** Toxic Substances
- **Class 6.2:** Contagious Matter
- **Class 7:** Radioactive Material
- **Class 8:** Abrasive Materials
- **Class 9:** Miscellaneous Hazardous Substances and Objects

#### **4. EVALUATION OF ADR CONSIDERATIONS FOR MANAGEMENT ACCOUNTING**

In the period when environmental change and competition were experienced on a global scale, the need for information in management decision making increased (rigor and rigor, 2000, p. The follow up of the current regulations and laws by the management of the enterprise is an indispensable information for the decisions regarding the operation. The ADR Agreement is important for the strategic management decisions of the related undertakings due to the scope of all operations which carry out activities related to the substances in the dangerous substance, namely the production of hazardous substances, the handling activities, the transportation activities.

##### **4.1. Administrative Fine of ADR Agreement**

It is possible for administrative authorities to face administrative penalties as a result of their failure to comply with the ADR Agreement provisions. Failure to comply with the ADR Agreement in Turkey administrative fines applied according to the Dangerous Goods Regulations are mentioned in Table 1.



**Table 1.** ADR agreement fines.

<b>Fine Subject</b>	<b>Related Regulates</b>	<b>Prices (Turkish Liras)</b>
Dangerous Goods Safety Adviser non employed	Regulation on the Transport of Dangerous Goods Article 28 - 4 (ğ) – 4 (ğ)	3.564
Obligation to Obtain Dangerous Goods Activity Certificate	Regulation on the Transport of Dangerous Goods Article 28 – 4 (c)	1.380
No Vehicle Transportation Documents of Dangerous Goods	Regulation on the Transport of Dangerous Goods Article 28 – 4 (ç)	689
Not having written instructions on the vehicle (sender)	Regulation on the Transport of Dangerous Goods Article 28 – 4 (d)	435
Not using Certified Packaging	Regulation on the Transport of Dangerous Goods Article 28 – 4 (a)	1.380
Label, Mark And Orange Plate Not Used	Regulation on the Transport of Dangerous Goods Article 28 – 4 (b)	Sender: 1.380 Carrier Firm: 689 Driver: 173
Fire Extinguisher Not Available or Incomplete	Regulation on the Transport of Dangerous Goods Article 28 – 4 (h)	61
General and Personal Protective Equipment Not Provided (Criminal Amount Applicable for Each Equipment Lack)	Regulation on the Transport of Dangerous Goods Article 28 – 4 (ı,i)	Carrier Firm: 61 Driver: 61
No copy of Vehicle Transportation Permit	Regulation on the Transport of Dangerous Goods Article 28 – 4 (f)	68
Compliance Certificate Do Not Fill Incorrect Tanks	Regulation on the Transport of Dangerous Goods Article 28 – 4 (j)	Tankage Firm: 1880 Carrier Firm: 1253
Failure of Bridge and Tube Gates Procedures and Principles	Regulation on the Transport of Dangerous Goods Article 28 – 4 (k)	Carrier Firm: 1782 Driver: 594

**Reference:** <https://www.tugem.com.tr/tehlikeli-madde-ile-ilgili-cezalar>, Access Date: 10.07.2018



If the entities associated with the dangerous substance are subject to the provisions of the ADR Agreement, they may continue to operate safely, exempt from administrative fines. It is legally obligatory to have the Dangerous Goods Safety Consultant (TMGD) through the Dangerous Goods Safety Consultancy Organizations (DGSCO) in order for the relevant authorities to apply the ADR Agreement provisions.

#### **4.2. ADR Agreement Exemptions and Exceptions**

Business managers of related to dangerous goods may have information on the exemption from the ADR Agreement provisions in the context of consultancy services to be provided by DGSA (O) and whether they will be able to benefit from the exception. ADR Agreement exemption and exception clauses are mentioned in the main section in Chapter 3 of the agreement but also in other relevant sections. The titles in which the exemption and exception provisions are included in the ADR Agreement:

- ADR Agreement Part 1, Article 1.1.3.1 "Exemptions Relevant to the Nature of the Carrying Activity"
- ADR Agreement Part 1, Article 1.1.3.2 "Exemptions Relating to the Transport of Gases"
- ADR Agreement Part 1, Article 1.1.3.3 "Exemptions Relevant to the Transport of Liquid Fuels"
- ADR Agreement Part 1, Article 1.1.3.4 "Exemptions Relevant to Special Provisions or Dangerous Goods Packed in Limited or Exceptional Quantities"
- ADR Agreement Part 1, Article 1.1.3.5 Exemptions Relating to Uncleaned Empty Packages "
- ADR Agreement Part 1, Article: 1.1.3.6 "Amount-related Exemptions Per Transport Unit"
- ADR Agreement Part 1, Article 1.1.3.7 "Exemptions Relating to the Transfer of Electric Energy Storage and Production Systems"
- ADR Agreement Part 1, Article 1.1.3.9 "Exemptions Related to Hazardous Goods Used for Cooling or Air Conditioning During Transportation"
- ADR Agreement Part 1, Article 1.1.3.10 "Exemptions Relevant to the Transport of Lamps Containing Dangerous Goods"
- ADR Agreement Part 1, Article: 2.2.6.2.1.5 "Exemptions"
- ADR Agreement Part 1, Section 1.5 "Exceptions"
- Section 3: "List of Dangerous Goods Regarding Limited and Exceptional Quantities, Special Provisions and Exemptions"

#### **4.4. Investigation of a Dangerous Goods in the Scope of ADR Agreement in terms of Management Accounting**

For example, if the dangerous substance with UN number 1005 is examined by the Dangerous Goods Safety Advisor according to the ADR Agreement, some provisions of the relevant substance may be listed as follows:





- **UN No:** 1005
- **UN Name:** Ammonia, anhydrous
- **Class:** 2 (Gases)
- **Classification Code:** 2TC (Liquefied Gas, Toxic , Corrosive)
- **Labeling:** 2.3 and 8
- **Limited Quantity:** 0
- **Exceptional Quantity:** E0 (Not Allowed as Exceptional Quantity)
- **Mix Packaging Provision:** MP9
- **ADR Tank Code:** PxBH(M)
- **Related Vehicle for Tank Truck:** AT
- **Special Provisions for Carriage:** S14
- **Dangerous Identification Number:** 268
- **Labels:**



The international name for the international dangerous goods identification number 1005 is Ammonia. Yilmaz (2005) defined ammonia as a poisonous gas that irritates the eye, skin and mucous membrane used in industry and fertilizer production. According to the ADR Agreement, the classification of dangerous goods is in the group of "2" gasses. There is toxic and corrosive damage effect of liquefied dangerous substance named ammonia. Exceptional quantity E0 means that in exceptional quantities for inner and outer packaging is not allowed under the ADR Agreement. In addition, this dangerous goods is the maximum total amount allowed to be transported in a transport unit according to the ADR Convention 1.1.3.6.3 of 50 kg. According to Article 6.1.4.21 of the ADR Agreement, the mixed packaging provision (Mix Pocket) MP9 provision is as follows:

- "with other dangerous substances in Class 2";
- "other mixed packing provisions with the materials in other classes according to their permits or";
- "They are allowed to be packed with substances that are not subject to ADR obligations, provided they do not constitute a hazardous reaction with each other".

According to the ADR Agreement, dangerous goods, buyers, sellers, carriers, etc. liabilities and obligations of the parties concerned. Interested parties may receive services from the Dangerous Goods Safety Advisor (DGSA) on a part-time basis through the Dangerous Goods Safety Advisory Organizations (DGSAO) to fulfill the ADR Agreement provisions, or they may continuously







maintain a DGSAO in their own organization. Taking into account the obligations of the parties involved, DGSA is required to present the report to the institution manager it serves.

Vural (2012) descriptively examined the relationship of a good ruler or leader with the orchestra conductor. As a result, an institutional manager, like the orchestra which is included different instruments, is able to achieve success by coordinating the different units in operation. A business manager who produces or services the dangerous goods should also take the DGSA report into account, taking into account general and cost accounting data. In addition, at the end of the year, the DGSA is obliged to use the accounting department of the ADR Agreement to report invoices related to dangerous goods to the relevant ministry. Example 1005 For Ammonia substance UN:

- Not receiving TMGD service at the operation,
- The absence of the necessary labels (2.3 and 8) for the hazardous substance concerned,
- Mixed packaging does not comply with MP9,
- Not to consider the limited and exceptional quantity requirements,
- The presence of a total of 50 kg of ammonia in excess of 1005 UN numbers in a transport unit,
- Not to consider the appropriate tank code for ammonia material UN number 1005 (PxBH (M),
- Penal provisions for ADR Agreement are applied in case of no preference for AT type vehicle for ammonia material of UN No. 1005 tank carriage.

## **5. CONCLUSIONS**

It is important for businesses to know international regulations at the time of the development of electronic commerce and at the same time to follow the updates on the regulations. The ADR Convention is a regulation of the United Nations that contains international standards for dangerous goods. The objective of this agreement is to ensure that the necessary international common security measures are taken before human health and a threat to the environment occur. Because the whole humanity pays the price of damage to the environment. All the parties involved in dangerous goods (depositors, carriers, producers, etc.) have obligations to fulfill in accordance with the agreement. It is a cost of being subject to the provisions of the ADR Agreement and it is a matter of administrative fines to be imposed on businesses not complying with these provisions. Every cost element that occurs in the business affects the price of the produced product. In this respect there is a relationship between the ADR Agreement and cost and management accounting. The business manager is responsible for ensuring that this relationship is carried out in good health. Coordination among the functions of the management is also included in the business administration literature.

For example, 1005 UN numbers, one of the dangerous goods Ammonia have been examined in order to see the concrete financial obligations of the ADR Agreement to the business. According to the ADR Agreement of the relevant hazardous substance, the report was prepared by the Dangerous Goods Safety Advisor. Before business manager has taken a vital decision like management, production, marketing, foreign trade, etc., he must examine the important reports like ADR Agreement reports for dangerous goods.

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