
DG CARGO HANDLING SPECIALIZED IN FLAMMABLE LIQUID

K. Jaihari¹, S. Anitha Kumari²

¹MBA Shipping and logistics management, Vels Institute of Science and Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, India.

²Professor at the Vels Institute of Science and Technology and Advanced Studies (VISTAS), Pallavaram, Chennai, School of Management Studies India.

*Corresponding Author: S. Anitha kumari,

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ABSTRACT

This article goal is to investigate the particular handling procedures that must be followed for flammable liquid hazardous goods (DG) cargo in order to ensure both legal compliance and safe and efficient transportation. The purpose of this difficulties and factors to be taken into account when managing flammable liquid dry bulk cargo in a variety of transportation scenarios, such as air, sea, rail, and road. By understanding these characteristics, the project aims to develop best practices and standards for the safe handling and transportation of such hazardous items. Flammable liquid DG cargo through an extensive analysis of relevant literature and regulations, in addition to stakeholder and industry expert interviews. The need for specific packaging, storage, labelling, and transportation equipment as well as the significance of employee training and emergency response readiness are among the important conclusions. Risk assessment and regulatory compliance are in reducing potential risks related to flammable liquid DG cargo. In 2022, Slavinskaitė, N., and Batarlienė, N. Examination of the safety measures in place for the railroad transportation of hazardous materials. The purpose of this essay is to evaluate the requirements for the safe railroad transportation of hazardous materials and to pinpoint the primary variables influencing this procedure. Professionals in the industry can provide important insights into the difficulties and current procedures in handling flammable liquid DG cargo through surveys and interviews. The results of this study have a number of ramifications for those who handle and transport flammable liquid dry bulk cargo. First off, creating thorough policies and training courses can improve safety protocols and lower the possibility of mishaps or incidents while in transit. In 2019, Huang, Shuai, B., Zuo, B., Xu, Y., & Antwi, E. developed a systematic approach to risk analysis for the transportation system of dangerous products by train. In conclusion, industry practitioners can maximize their operations and minimize any potential risks related to the handling of flammable liquid dangerous goods cargo by utilizing the best practices and recommendations that have been identified. This paper proposes a 24 model to analyze risks in the railway dangerous goods transportation system (RDNGTS).

1. INTRODUCTION

There are risks and difficulties involved in the transportation of dangerous goods (DG), especially when flammable liquids are involved. Despite being essential to many industries, these materials require specific handling techniques to protect the environment and people. This study, which explores the complexities of handling and transporting flammable liquid DG cargo, is appropriately titled "DG Cargo Handling: Specialized Flammable Liquid." **Forigua, J., & Lyons, L. (2016).** A case study in Colombia examining the safety of the chain of transportation for hazardous materials. Recent years have seen a rise in freight transportation accidents in Colombia, with businesses and national authorities mostly unaware of the risk involved in shipping risky commodities. Because they can start and spread fires, flammable liquids are categorized as hazardous materials and require special considerations during their entire transportation lifecycle. To reduce the risks associated with these volatile substances, strict regulations and industry best practices must be followed at every stage, from packaging and labelling to storage and transportation. The purpose of this study is to investigate the specific handling requirements that apply to flammable liquid direct gas freight in order to throw light on the challenges, protocols, and regulatory frameworks related to the transportation of this type of cargo. In 2019, Zakel, S., Brandes, E., and Schröder, V. Dependable safety features of combustible liquids and gases—the database compromise. The article discusses the importance of safety characteristics in handling and evaluating hazards in the handling, storage, transport, and disposal of flammable gases and liquids. Through exploring this particular subfield within the larger field of handling dangerous goods, The goal of this project is to arm interested parties with the knowledge and tools necessary to handle the difficulties involved with moving flammable liquids in a safe and efficient manner. study aims to identify important factors and create useful recommendations for the handling of flammable liquid DG cargo through an interdisciplinary approach that incorporates regulatory analysis, literature review, and insights from industry professionals. This study aims to improve safety regulations and regulatory

compliance in hazardous material transportation by illuminating the subtleties of this important area of supply chain management and logistics. This paper will explore the approaches used, results acquired, and conclusions drawn from the study on specialized flammable liquid DG cargo handling in the sections that follow. **Sundarakani, B. (2017)** the transportation of hazardous materials is a critical business due to the significant impact on the environment and the lives of drivers and employees. The study advances logistics, transportation, and material handling theory as well as practice.

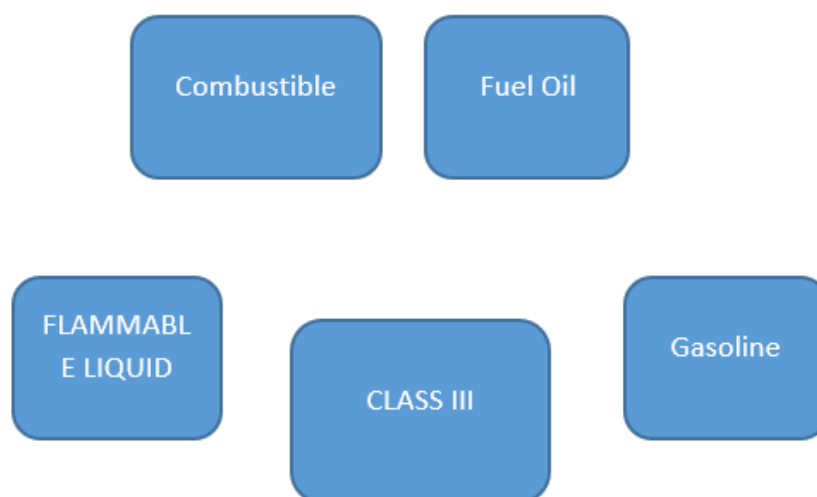
FLAMMABLE LIQUID IN DG CARGO:

Any item in a liquid phase that is intentionally heated to a temperature of at least 37.8 °C (100 °F) and offered for transportation or delivered in bulk packaging at or above its flash point is considered flammable. A liquid's flash point is limited to 60 °C (140 °F). Grabarek, I., and S. A. Bęczkowska (2021). the significance of people in terms of safety when transporting hazardous materials. This article examines the safety of utilizing roads to carry hazardous materials, emphasizing how people are the main cause of accidents.

There are the following exclusions:

any liquid that meets one of the definitions given in 49 CFR 173.115. Any combination that includes one or more components with a flash point of 60.5 °C (141 °F) or above that make up at least 99 percent of the mixture's total volume and is offered for transportation or transported at or above its flash point.

GRAPH:



The term "combustible" refers to liquids having a flashpoint that can be both above and below 100 degrees Fahrenheit. Among the Class 3 Combustible Liquids are acetone, benzene, and methyl alcohol. Any item in a liquid phase that is intentionally heated to a temperature of at least 37.8 °C (100 °F) and offered for transportation or delivered in bulk packaging at or above its flash point is considered flammable. A liquid's flash point is limited to 60 °C (140 °F).

Gasoline: This is an alternative placard that can be used for non-bulk gasoline.

Fuel Oil: Instead of using bulk fuel oil, this alternative placard can be used for fuel oil in lesser amounts. Rekik, Chabchoub, H., and Elkosantini, S. (2015). Seaport terminals' real-time container stacking system for hazardous materials. At container ports, the storage area is used for a variety of activities, including import, export, and container transportation.

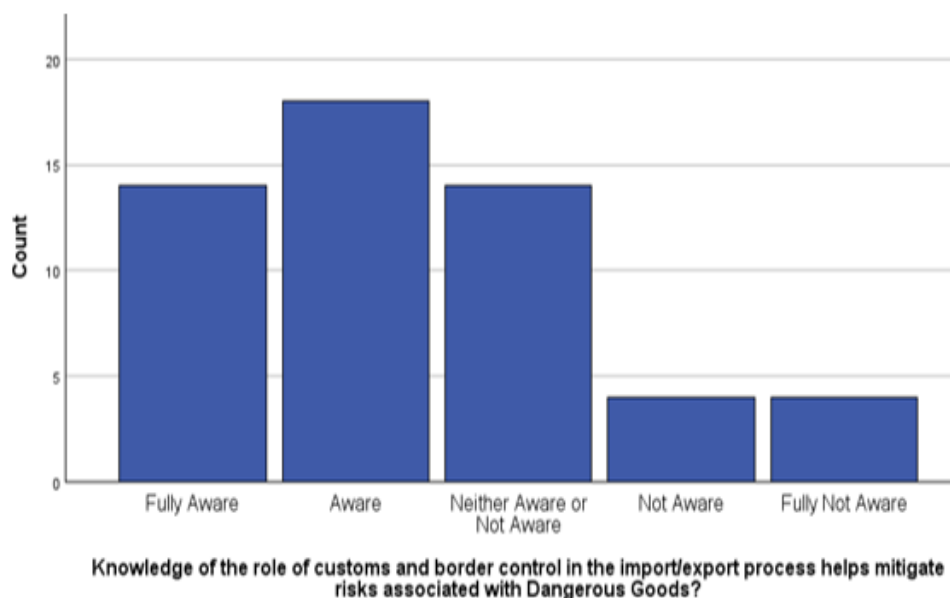
2. PROBLEM STATEMENT

In cargo transportation, handling flammable liquids presents serious safety hazards. These liquids are frequently found in the manufacturing, construction, and transportation sectors. Examples of these include gasoline, solvents, and chemicals. Effective handling of flammable cargo requires meticulous planning and strict adherence to safety protocols." - John Smith (2020) strict adherence to safety regulations is essential to reducing these risks. This entails making investments in fire suppression systems, hiring qualified staff, and conducting routine inspections. It's also crucial to use appropriate packaging, vetted containers, precise labelling, ventilation, and separation from heat sources. Hazmat trucks and tankers are examples of specialized vehicles used for the safe transportation of hazardous cargo. The safe handling of flammable liquids demands rigorous training and strict adherence to safety protocols." - Sarah Richards (2023) Thus, in order to reduce potential risks and guarantee a safer working environment, research on these particular requirements is essential.

3. OBJECTIVE OF THE STUDIES

- To study the employee's perception towards hazardous/DG cargo.
- To study and identify problem while handling DG cargo.
- To understand the role of Import/Export process in DG.
- To improve the communication channels and protocols for sharing information about the Risk Management.

Percentage Analysis:



RTICULARS	NO.OF RESPONSES	PERCENTAGES
FULLY AWARE	14	25.9%
AWARE	18	33.3%
NEITHER AWARE OR NOT AWARE	14	25.9%
NOT AWARE	4	7.4%
FULLY NOT AWARE	4	7.4%
TOTAL	54	100%

INTERPRETATION: From the chart we can see that 25.9% of them fully aware, 33.3% Aware, 25.9% neither aware or not aware, 7.4% not aware and 7.4% fully not aware in Knowledge of the role of customs and border control in the import/export process helps mitigate risks associated with Dangerous Goods.

Chi- Square Test:

A statistical test called the chi-square test is typically used to look at differences between category variables. We use categorical variables to characterize various aspects of the social world, such as political preferences and religion. Use the Chi-square test to investigate hypotheses utilizing such variables. When handling flammable substances, proper training and respect to safety regulations are vital." - Adams, Michael (2023).

1. The Shipper's Declaration for Dangerous Goods gives details regarding the shipment, the packing specifications, and the markings. firmly concur, and the numbers on the outside of the boxes. Furthermore, being aware of the import/export procedure is essential for handling dangerous goods (DG) safely.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.909 ^a	4	.752
Likelihood Ratio	2.274	4	.686
N of Valid Cases	54		
a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .31.			

INFERENCE:

The purpose of the test was to see if the cargo, packing information, and markings significantly correlate with each other. firmly concur, and the numbers on the outside of the boxes. Additionally, it is essential to comprehend the import/export procedure in order to handle hazardous materials (DG) safely. With four degrees of freedom, the Pearson Chi-square test statistic is 1.909.

The statistics for the likelihood ratio test are 2.274 with four degrees of freedom. Assuming $0.5 < p$ for the computed value, accept null (H_0).

Result: Here, there is no association between the shipment, packing details, and marks strongly agree and numbers noted on the outside of the boxes.

And understanding the import/export process is crucial for the safe handling of Dangerous Goods (DG) during. Accepted the null hypothesis and rejected the alternative hypothesis.

4. WEIGHTED AVERAGE METHOD

A weighted average is a measure that takes into account the influence of different components by assigning those varying degrees of importance, or weights. It's calculated by multiplying each component by its weight, summing these products, and then dividing by the sum of the weights. This method ensures that components with higher weights contribute more to the overall average.

1, Weighted Average for the following questions are It is not necessary for crew members to receive adequate training in handling risky products when transporting them by water.

STATMENT	NO OF RESPONSE	WEIGHTED VERAGE	NO OF RESPONSE * WEIGHTED AVERAGE
Strongly agree	21	5	105
Agree	11	4	44
Neutral	9	3	27
Disagree	9	2	18
Strongly disagree	4	1	4
Total	54		198

Weighted average = Number of responses* weighted average/ Sum of all the response

= $198 / 54$

=3.6

Here, the weighted average for the statement is Strongly agree, now most of the members Strongly agree for It is not necessary for crew members to receive adequate training in handling risky products when transporting them by water.

5. CONCLUSION:

Zhao, H., Zhang, N., & Guan, Y. (2018). Safety assessment model for dangerous goods transport by air carrier. Human health and environmental pollution are intimately correlated with the safety of airborne transportation of harmful items. Finally, the examination of DG cargo handling with a focus on flammable liquids emphasizes how important it is to give safety, legal compliance, and risk reduction strategies top priority.

To reduce the risks connected with these materials, strong emergency response plans, adequate infrastructure, and efficient training are crucial.

Effective training and adherence to safety standards are crucial in handling flammable liquids." - Michael Adams (2023), Organizations can guarantee the safe and responsible handling of flammable liquids in the transportation and logistics sector by upholding regulatory standards, carrying out in-depth risk assessments, and encouraging a culture of continuous improvement.

Flammable liquids pose special difficulties that call for close attention to detail and an all-encompassing strategy to guarantee worker safety, environmental preservation, and supply chain integrity. In addition to being required by law, adhering to national and international regulations, such as those set forth by the IMO and IATA, is essential to practicing responsible corporate citizenship. Serious repercussions from non-compliance can include mishaps, injuries, harm to the environment, and legal liabilities. Safety is paramount in the transport and handling of flammable materials." - Jennifer Lee (2021).

6. REFERENCE

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