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## Challenges faced in over dimension cargo – Case Study

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### ABSTRACT:

This study's Focus is to offer a thorough grasp of the difficulties and issues related to the transportation of over-dimensional cargo. The purpose is to facilitate the development of strategies and methodologies to improve the efficiency, safety, and cost-effectiveness of transporting oversized loads by clarifying these obstacles. "Navigating Challenges: A Comprehensive Study of Over-Dimensional Cargo Transport" (John Smith, 2018)

The study adopts case study methods and literature reviews, to obtain a comprehensive understanding of the obstacles encountered by the parties engaged in the transportation of over-dimension cargo. Initial results indicate that there are numerous and varied difficulties involved in moving over-dimension cargo, covering areas such as infrastructure, safety, logistics, and regulations. Additionally, the problems discussed can guide strategic decision-making in the transportation of over-dimension cargo, enabling them to adopt proactive measures to mitigate risks and optimize operational performance.

Keywords: Transportations, over dimensional cargo, logistics, safety handling, Challenges, and equipment.

### Introduction:

Over-dimensional cargo transportation has become increasingly popular in the logistics industry, especially in the manufacturing, construction, and energy sectors. To guarantee the safe and effective transportation of these large loads, several issues and challenges have been brought about by the increased demand. over-dimensional cargo is defined as cargo that is larger than standard dimensions and necessitates special handling techniques and equipment to be transported effectively and safely. The difficulties and issues associated with transporting over-dimensional cargo are numerous and, if not properly handled, can have serious repercussions. In addition, especially when handling international shipments, the intricacy of arranging logistics and guaranteeing regulatory compliance can be intimidating. "Overcoming the Obstacles: A Closer Look at Challenges in Over-Dimension Cargo Transportation" (Emily Johnson, 2020)

In addition, one major obstacle to guaranteeing the safe transportation of these large loads may be the requirement for specific training and experience among handlers and drivers. In this regard, it is crucial to comprehend the different obstacles and issues associated with the transportation of over-dimensional cargo and to devise practical plans to reduce these risks and guarantee the orderly and effective transfer of these vital items. Raja G Kasilingam, (2009) This paper introduces two-dimensional overbooking problems in cargo revenue management, comparing them with one-dimensional problems and addressing capacity spoilage and offloading costs. It presents Curve (Cab) and Rectangle (Rab) models, where acceptance regions are defined by curves or rectangles, with the optimal curve shown to be unique and continuous, and an approximate rectangle proposed for practical use, yielding costs close to optimal. Yue, et.al (2020, March). This paper presents a VB.NET-based system for formulating reinforcement schemes for exceptional dimension cargo in railway transportation, simplifying the task for cargo forwarders. It generates loading plans and reinforcement schemes, considering relevant parameters and speed limits, streamlining the process of obtaining solutions for both simple and complex cargo. Mateus, F (2022, December) Amidst COVID-19's container shortage, a novel approach utilizing restrictions and the Non-Linear GRG algorithm optimizes container loading, achieving 80% to 90% occupancy, vital for efficient decision-making in container consolidation services. Anisul Islam, (2023) This paper explores the role of asset/non-asset logistics conglomerates in project logistics and over-dimensional cargo handling, highlighting the impact of modern technology on efficiency, cost reduction, and safety. Bin Xu, (2022) This paper presents a three-dimensional stowage optimization method for cargo ships, utilizing an improved genetic algorithm to minimize reloading and maximize loading volume. Ran, Z. (2020, March) This paper introduces a VB.NET-based system for creating reinforcement schemes for exceptional dimension cargo in railway transportation, simplifying the process for forwarders. Yamashita, D. S. (2012) The paper presents mixed integer linear programming models for container loading, demonstrating their effectiveness for moderate-sized problems and recommending future research on alternative solutions. Siciliano, E. R. (2006), October Pacific Northwest National Laboratory developed computer models for screening vehicles and cargo for

illicit radioactive materials, emphasizing the importance of matching detector height with container height for effective detection. Limbourg, S. (2016) This paper optimizes box loading into containers to minimize unused volume using a mixed integer linear program considering real-world constraints and small instances validation. Kim, Y. (2001), June The paper presents computational findings on three-dimensional sloshing in ship cargo, incorporating ship motion solving and finite difference methods, validating against experimental and computational data.

## 2.1 Over dimensional cargo challenges:

"Over dimensional cargo" pertains to cargo or freight that surpasses the typical weight or dimension limitations for conveyance via roads, railroads, or other traditional modes of transportation. This kind of cargo has particular requirements for handling, permits, and occasionally specialized transportation options. It also poses unique challenges. "Beyond Size: Understanding and Addressing Problems in Over-Dimensional Cargo Handling" - Michael Brown, (2019) Large industrial equipment, machinery, building supplies, and infrastructure project components are examples of over-dimensional cargo. The precise definition may differ slightly based on the jurisdiction or the mode of transportation. These goods frequently fit inside the confines of conventional transportation only because they are too big, heavy, or awkwardly shaped.

### Over-dimensional cargo challenges

- Logistics Complexities
- Safety Concerns
- Infrastructure Limitations
- Environmental Impact
- Cost Implications

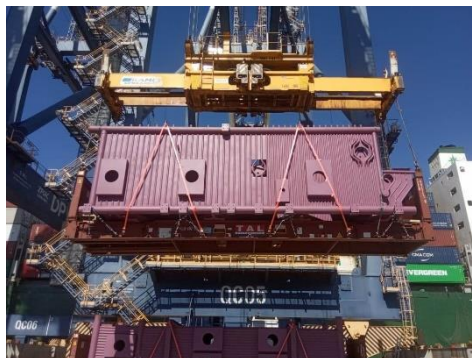
Over-dimensional cargo has several challenges and problems. "The Road Less Traveled: Tackling Challenges in Over-Dimensional Cargo Logistics" - Sarah Adams, 2021 Here, logistics complexities, infrastructure limitations, environmental impact, cost implications, and safety concerns.

## 2.2 Problem Statement

The company is an international freight forwarder specializing in the optimization of the supply chain, logistics, warehousing, and distribution of freight. The company began as a basic service provider for air and sea freight movements in 2007 in Chennai. Islam, (2023) - This paper analyses the impact of modern technology on over-dimensional cargo transportation in Bangladesh, focusing on its efficiency, cost reduction, and safety enhancement.

They have grown into an organization with expertise in providing integrated logistics solutions to meet customer needs. Kulon Progo Regency Purnomo, & Suryono, (2022) - This study investigates the implementation of supervision by the Kulon Progo Regency Transportation Service in Indonesia, focusing on Over Dimension and Over Loading violations. Qualitative research using interviews, observations, and questionnaires revealed that 50% of respondents were in the maintained category. It expanded its business to other major cities over the years, establishing offices in Mumbai, Delhi, Tuticorin, and Tirupur. Hundreds of customers choose Phoenix as their logistics partner for their shipping needs.

The company needs to export the supply of rubber-lined anolyte tank from Ennore Sea Port to Aqaba Seaport, Jordan. The dimension of rubber lined anolyte tank: (L\*W\*H in cms): 600x250 x340). Moussawi-Haidar, & Cakanyildirim, (2012) -This article explores a two-dimensional cargo overbooking problem, aiming to find optimal weight and volume limits to maximize profit. The company embarked on a challenging transportation project involving the shipment of oversized rubber-lined anolyte tanks from Ambattur Industrial Estate to Aqaba Sea Port, Jordan. This case study highlights the operational processes and challenges faced by Phoenix Logistics during the cargo rotation from Ambattur Industrial Estate to Ennore CFS, port of loading at Ennore Port, and port of discharge at Aqaba Sea Port, Jordan. "Size Matters: Exploring the Challenges Faced in Over-Dimension Cargo Transport" - David Thompson, 2017.



Source link: Loaded on 3 x 40' Flat Rack Containers OOG 1 x piece loaded on a Flat Rack Bed on board

### **2.3 Operational Process:**

The company coordinated with suppliers and obtained the necessary documentation for a project involving oversized cargo. They obtained permission from Customs House and Ennore Port authorities, presenting detailed transportation plans. The oversized anolyte tanks were loaded onto flat rack containers at Ambattur Industrial Estate and transported via Manali Highway to Ennore CFS. Region Galor, & Galor, (2011) - The paper discusses the challenges faced by carriers during the preparation and transport of oversized cargo (OC) in Poland, focusing on the international program Oversize Baltic, which aims to standardize procedures related to OC transport in the South Baltic Region. They monitored the shipment's progress and maintained communication with stakeholders. Upon arrival at Aqaba Sea Port, the cargo underwent unloading and clearance procedures.

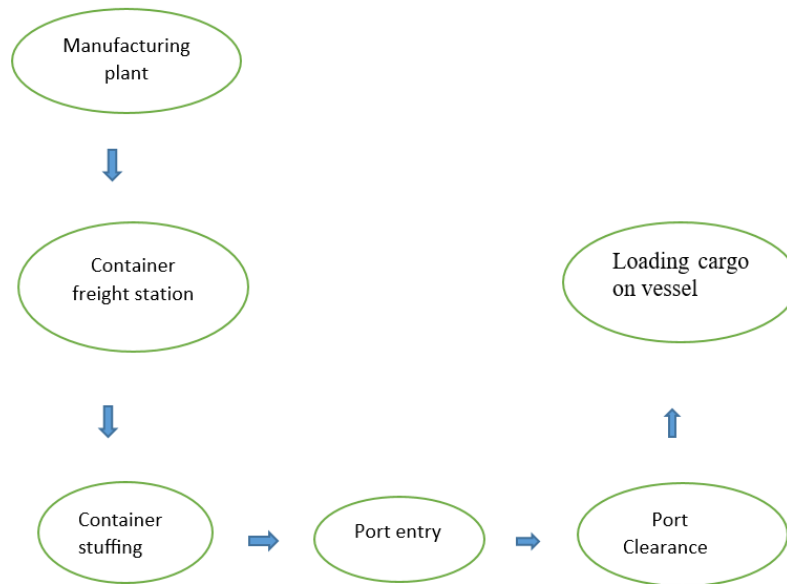
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### **Challenges:**

The company coordinated with suppliers and obtained the documentation for an over-dimension cargo project. Factors to be considered in transporting over-dimension cargo Cargo data that is cargo dimensions have to be specified and what the material is made of has to be mentioned, Valuation of the packing list and invoice, the origin and destination places, And provide port to port specifications be mentioned, Terms of shipment have to be implemented based on dimensions Mostly it is ex works incoterm, Pick up from factory floor to delivery in Container Freight Station, Vehicle arrangement has to be on time, Road survey and inspection must be carried out, Place booking and confirmation, Container stuffing in Container Freight Station, Based on road survey loading, Lashing has to be done in presence of a board-certified surveyor, Lashing is the process of securing the cargo on the flat track container using ropes, wires, webbings, bandings, strappings, chains to minimize shifting in transit. Lashing has to be done with the recommended steel cable of diameter 1mm to 1.1mm and 1.5mm and 1.6mm from 150 feet of 400 series stainless steel wire. Lashing should be enough to prevent loads from moving when the ship rolls through 30 degrees with a 30-second duration. The company faced a lot of challenges in Selecting a trailer vehicle and managing the lack of equipment, Southern Railways and other RTO, NHAI, STATE, and central government agencies must be involved in this shipment, The transportation of oversized cargo is complex due to the involvement of multiple government agencies and varying regulations. Coordination with these bodies is essential but requires careful planning and communication. Route selection and scheduling are crucial, considering weather conditions and road hazards. The selection of a suitable trailer vehicle is essential, but availability can be challenging. Managing equipment shortages is another challenge, requiring strategic planning and collaboration with external partners. A comprehensive approach is needed to ensure smooth and efficient transportation of oversized cargo. They obtained permission from Customs House and Ennore Port authorities, presenting detailed transportation plans. The rubber-lined anolyte tank dimensions are Length - 600 Width - 250 Height - 340, and a Total weight of 5 tons. I give a solution A low bed trailer truck with a low flat is 3 feet from the ground, choosing a flat track container, implementing a single window policy to integrate all the stakeholders, Infrastructure must be improved, and handling equipment. the company monitored the shipment's progress and maintained communication with stakeholders. Upon arrival at Aqaba Sea Port, the cargo underwent unloading and clearance procedures. Pisz, & Łapuńska, (2016) - The transportation-freight forwarding-logistics sector performs diverse projects based on clients' orders, with a growing emphasis on project-based logistics. The paper focuses on oversized cargo transportation, highlighting the importance of factors like industry, energy, infrastructure development, investment projects, and economic policies. The transportation of oversized cargo is complex due to the involvement of multiple government agencies and varying regulations. Coordination with these bodies is essential but requires careful planning and communication. Route selection and scheduling are crucial, considering weather conditions and road hazards. The selection of a suitable trailer vehicle is essential, but availability can be challenging. Managing equipment shortages is another challenge, requiring strategic planning and collaboration with external partners. A comprehensive approach is needed to ensure smooth and efficient transportation of oversized cargo.

The Challenges faced in this case study as a direct impact on the parties involved in the business Shipper, Consignee, and Transporter due to the delay in cargo delivery and time delay of cargo.

### 3.1 Graph:



The above graph shows challenges and problems in the transportation of dimensional cargo. The chain-related, in-manufacturing plant cargo is loaded in a container and moved to the container freight station again the cargo will be stuffed properly in the CFS with a warehouse seal. Then the container moves to the port and the port clearance will be verified. Finally, the cargo container was loaded on the vessel.

### Conclusion:

Despite facing various operational challenges, the company successfully executed the transportation of oversized rubber-lined anolyte tanks from Ambattur Industrial Estate to Aqaba Sea Port, Jordan. Through meticulous planning, adherence to regulatory requirements, and effective coordination with stakeholders, the company demonstrated its capability to handle complex logistics projects involving oversized cargo, reaffirming its commitment to excellence in the field of container transportation services. Betkier, (2020) The article discusses the routing stage for oversized vehicles in the planning process for oversized cargo carriages. Factors determining the route include vehicle parameters, maximum single axle weight, gross vehicle weight, and atmospheric conditions. These factors can negatively impact infrastructure and traffic participants, and negligence in their analysis can lead to fatal consequences.

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### Biography:



Mr. Karthick S, pursuing an MBA -Shipping & Logistics Management at Vels Institute of Science, technology, and Advanced Studies. I did this research as a title on challenges and problems faced in over-dimension cargo and learned more about the freight forwarding industry.



Dr. S. Vasantha, professor of Vels Institute of Science, technology and advanced studies. She, presently working as a Professor in the department of MBA at Vels Institute of Science, Technology & Advanced Studies (VISTAS) since 2011. She has published 10 books, and 117 Scopus-indexed articles Under her guidance 11 MPhil scholars and 24 PhD scholars were awarded PhD degrees. During the year 2019-Seminar/Partial financial Assistance of Rs.15000 received from TANSCT for organizing National Conference on Technology Enabled Teaching and Learning in Higher Education