

# Analysis on the Current Situation of the Management of Imported Raw Materials Transportation for Large Cruise Ship

Sheduxiu Wang

Institute of Economics and Management, Jiangsu University of Science and Technology, Zhenjiang 212000, Jiangsu, China

504104473@qq.com

**Keywords:** Large cruise ship, Imported raw material, Transportation

**Abstract:** This paper sorts out the characteristics of large cruise ship materials, analyses the current situation of imported raw material transportation for large cruise ship, collates the current problems of imported raw material transportation, summarizes the root causes of their generation and proposes methods to solve the root causes.

## 1. Introduction

Transport costs are the “third source of profit” for shipbuilding enterprises. The level of transport costs is directly related to the profitability of the enterprise, and the level of the supply chain determines the market competitiveness of shipbuilding enterprises. Most of the raw materials required for the construction of large cruise ship in China are imported, and the suppliers of raw materials are spread all over the world, requiring cross-border and cross-territory supply, the whole supply chain includes the production of suppliers, transportation of goods and customs clearance, etc. Most of the materials need to be shipped from suppliers in Europe, which is also affected by the dual impact of the epidemic and the turbulent situation in Europe, making the time for the supply of materials relatively long and the supply The stability of supply is relatively weak, and in case of emergency replenishment, a large amount of additional transport costs are required. Therefore, in order to reduce the transportation costs of imported raw materials for large cruise ship, we should understand the problems that exist in the transportation of raw materials for large cruise ship.

This paper mainly compares the general situation of imported raw material transportation of large cruise ship, summarizes the major problems of imported raw material transportation at present and carries out detailed analysis for these problems, determines the root causes of these three problems, and proposes that the problems in the process of imported raw material transportation should be solved by establishing a set of scientific decision-making methods.

## 2. Analysis on the Current Situation of Imported Raw Materials for Large Cruise Ship

### 2.1 Characteristics of Raw Materials for Construction

In order to study the transportation of raw materials for the construction of large-scale cruise ship, it is necessary to understand the characteristics of the import transportation of raw materials for the construction of large-scale cruise ship:

① Large number and variety. A wide range of raw materials are available for the construction of large cruise ship, including a wide range of construction materials for the main hull, equipment for the installation of interior cabins and special high-tech equipment for customization. Different material specifications, different application scenarios, but can also be divided into different types, for example, seamless steel pipes for cruise ship need to use more than 300 types, so the total materials for cruise can be in the tens of thousands of types. In addition, given that more than 2,000 inner cabins are built for cruise ship and approximately 30 inner cabins for cargo ship, the number of spare parts needed for cruise ship is extremely high, up to 20 million, which is approximately 50 times more than for conventional cargo ship. The consumption of auxiliary equipment is also very

high, e.g. the length of cable used by conventional cargo ship is only 110 km, while cruise ship use more than 2000 km of cable.

②Suppliers from all over the world. Based on the experience of foreign cruise ship builders, there are many special cruise ship materials that are unique only to them at the time of construction, these cruise ship builders can rely on the supply of domestic mature cruise ship suppliers. Currently, almost 80% of the special cruise ship building materials in our country have to be imported, and the production areas for the different materials are widely dispersed and the sources of supply are worldwide. The difference in time, distance and other factors makes it difficult for foreign suppliers to keep up with local shipbuilders. In addition, cruise ship manufacturing has a relatively single source of goods and materials as it cannot rely on local ship maintenance companies for production materials, this type of dispersed supply environment of foreign suppliers makes it difficult to manage suppliers and it is very easy to influence the sourcing of cruise ship materials.

③Long delivery times and high costs. The whole supply chain involves production of suppliers, transport of goods, customs clearance, etc. Most materials have to be purchased from European suppliers. The majority of materials have to be sourced from European suppliers, which leads to longer delivery times and lower security of supply than domestic sourcing methods. In addition, in order to respond quickly to urgent deliveries or material transport needs, many parts have to be transported by air in addition to traditional water transport methods, which results in high additional transport costs.

## **2.2 Description of the Decision-Making Process for the Transportation of Imported Raw Materials**

The decision making process for transportation mode selection differs between procurement and material planners depending on whether the material is a regularly purchased raw material or not. For materials purchased on a regular basis, the appropriate mode of transportation is selected based on the appropriate weight standards and with reference to past transportation experience. For raw materials not purchased on a regular basis, an application to the director or minister is required, and other transportation methods may be used only after approval by the supervisor.

①Transportation mode selection criteria. The material planner selects a certain transportation mode based on the preliminary judgment of the weight level of the goods, but the actual situation is complicated and the transportation mode cannot be selected exactly according to the weight level. In practice, the general choice of international express transport below 100kg, due to time or other factors, more than 100kg will also choose international express, which will cause an increase in transport costs. Similarly, in the sea freight LCL transport, full container transport, railroad transport, the main consideration is the weight or volume heavy, the general weight of more than 3000kg, will consider choosing full container transport. When the volume of goods reaches 5000kg and there is a stopping point of international railroad near the supplier's location, railroad transportation will also be considered.

To sum up, material planners of shipbuilding enterprises will make subjective judgment based on experience when choosing transportation methods, which requires high qualification of material planners. However, in fact, due to factors such as the first large domestic cruise ship, most of the material planners in the existing material teams of shipbuilding enterprises lack experience, except for a few material planners who are experienced in their work. As a result, the problem of improper choice of transportation mode occurs from time to time.

②Imported raw materials transportation operation process. When choosing the transportation mode, the material planner mainly refers to the previous transportation decision and chooses the corresponding transportation mode for the raw materials purchased regularly. Then, the material planner arranges freight forwarder for pickup and transportation. After the cargo is delivered to the domestic port (airport or station), the freight forwarder is then responsible for customs clearance and delivery to the shipbuilding company.

## **3. Analysis of Imported Raw Material Transportation Problems**

In the transportation of imported raw materials, imported raw materials are delivered to the shipbuilding company's warehouse by the selected transportation method according to the material demand plan, which enables the company to carry out normal production activities and the supply chain to run well. However, an analysis of the imported raw material transportation data of shipbuilding enterprises from July 2020 to December 2021 reveals that there are many problems with imported raw material transportation, mainly high transportation costs, low transportation reliability and high transportation risks. These problems are analyzed below.

### **3.1 High Transportation Costs**

The transportation cost of large cruise ship mainly includes direct freight and related miscellaneous expenses, and the collated data reveals that the ratio of transportation cost to total cost increases year by year, which is mainly due to three reasons: firstly, due to improper planning of material planner, which leads to the need of large amount of replenishment, resulting in high air freight cost; secondly, the confusion of material demand leads to one supplier will place separate orders and increase the frequency of transportation, and many fees are charged according to the frequency of transportation, which invariably increases the transportation cost; thirdly, it is caused by improper decision of transportation mode.

### **3.2 Low Transportation Reliability**

The transportation cycle of raw materials imported by large cruise ship is long. From the time the materials are shipped by suppliers to the shipbuilding enterprises, the shipping and railroad transportation cycles are 35-60 days and 19-25 days respectively, and the fastest air transportation is also 8-14 days. The long transportation cycle leads to a lower controllability of the materials in transit, and the current impact of the new crown epidemic makes it even more impossible to guarantee production. Since there is no third-party support from other companies for these raw material suppliers, and shipbuilders have very strict inventory control on materials, the long transportation lead time may lead to interruption of production plans if the suppliers cannot deliver according to the delivery schedule.

### **3.3 High Transportation Risks**

In international transportation, sea transport is the most risky, followed by rail transport and air transport. The risk of transportation mode itself is unavoidable for any import supplier, and that risk can only be transferred by purchasing transportation insurance. The high transportation risk of the existing transportation methods of shipbuilding enterprises and the susceptibility to transportation risk disputes are mainly due to the improper choice of transportation methods, which makes the probability of transportation risk increase.

## **4. Root Cause Analysis of the Problem of Importing Raw Materials for Large Cruise Ship**

The operation process of the shipbuilding enterprise to decide the mode of transport of imported raw materials is decided by each material planner, and the material planner makes a rough decision on which mode of transport to choose based only on the weight class and his own experience, which is not rigorous enough and easily carries This is not rigorous enough and can easily be tainted by personal subjective preferences. Each material planner is responsible for 1-2 production lines of materials, and among the many import suppliers, there are many suppliers that are shared by different material planners, but they usually place separate orders and make their own decisions. Due to the different working habits of each material planner, or the different needs of the production lines, and the different delivery dates of different orders, there are multiple shipments of material from the same supplier in the same cycle. This decentralized decision-making by the material planners, with small single shipments, leads to an increase in the frequency of transport, but in the composition of transport costs, many miscellaneous fees are charged on a per-shipment basis, such as customs clearance fees, pick-up fees, change order fees, testing fees, etc. Such decisions can make the total transport costs increase and can also affect transport mode decisions. A process

system for decision making should be developed so that material planners have a basis to follow when making decisions.

This paper therefore seeks to improve the problem of transporting raw materials for large cruise ship by establishing an optimal transport method decision method. An effective transport mode decision method can form a system for material planners to follow and, subject to other conditions, can significantly reduce total transport costs.

## 5. Conclusion

This paper gives a detailed description of the characteristics of cruise ship materials and visually illustrates the complexity of cruise ship materials; it composes an overview of the transport of imported raw materials for large cruise ship, summarizes the three major problems of the current transport of imported raw materials: high transportation costs, low transportation reliability and high transportation risk and concludes that the improper selection of existing transport methods and the absence of a scientific process system are the fundamental reasons for the high cost of transport for large cruise ship, indicating that the problems in the process of transporting imported raw materials should be solved by establishing a set of scientific decision-making methods.

## References

- [1] Mihail Diakomihalis, Evaggelia Stefanidaki, Evangelos Chytis. Cruise ship cost analysis: an AHP study on cost components. *Int. J. of Decision Sciences, Risk and Management*, Vol.6, no.3, pp.265-280, 2016.
- [2] Cheon Young Wook, Chang Woo Lee, Shin Yong John. A Study on the Cargo Management of Export and Import Logistics in the Shipbuilding & Marine Equipment Industry. *Journal of Navigation and Port Research*, Vol.40, no.6, pp.469-476, 2016.
- [3] Liling Huang, Jiaqi Yang. Location-distribution of cruise ship supply logistics distribution centre considering time window. *Systems Science & Control Engineering*, Vol.7, no.1, pp.338-345, 2019.
- [4] Strandhagen Jo Wessel, Jeong Yongkuk, Woo Jong Hun, Semini Marco, Wiktorsson Magnus, Strandhagen Jan Ola, Alfnes Erlend. Factors Affecting Shipyard Operations and Logistics: A Framework and Comparison of Shipbuilding Approaches. *ADVANCES IN PRODUCTION MANAGEMENT SYSTEMS: TOWARDS SMART AND DIGITAL MANUFACTURING*, Vol.592, ppp.529-537, 2020.