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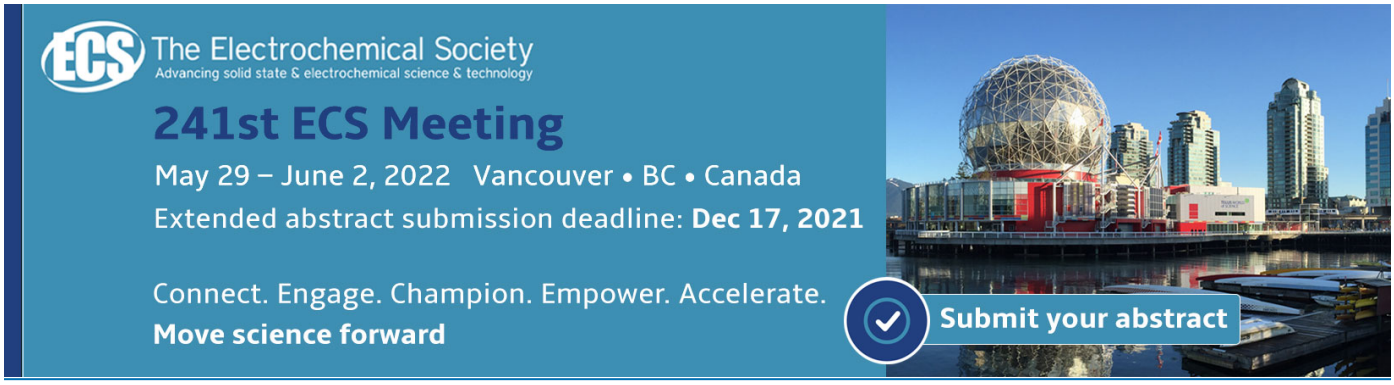

A Study on the Development of Container Sea-rail Intermodal Transport of Xiamen Port in the Context of National Logistics Hub

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Aabstract: Container sea-rail intermodal transport has the characteristics of low cost, low emission and large scale, and has become one of the important indicators to measure port development. Xiamen has been identified as the strategic fulcrum city of the 21st century Maritime Silk Road, national logistics hub of port type, and Xiamen Port will have great opportunities for development. But, the development of container sea-rail intermodal transport of Xiamen Port is still in the period of market cultivation, and the development level is relatively backward. This paper analyzes the problems in the development of Xiamen Port container sea-rail intermodal transport in terms of railway transport, port operation, shipping company and the construction of information system for rail sea intermodal transport, and put forward the development measures include constructing the railway trunk line and the railway branch lines in port area, building the operation platform for combined transport, paying attention to the source of goods for long-distance and so on. Also, this paper puts forward some implementation plans, such as strengthening organization and coordination mechanism, cultivating leading enterprises, strengthening investment promotion.

1. Introduction

In recent years, with the development of railway network, Xiamen railway transportation network has been continuously improved. Xiamen port has successively opened container sea-rail intermodal transport lines which included Sanming, Yong'an, Nanchang, Ganzhou, Ji'an, Xinyu, Pingxiang, Yingtan, Shangrao, Jingdezhen and other cities. And its business network up to is 15, which has coverd most of Fujian, Jiangxi and Hunan, and gradually extended to the vast central and western regions of China.Also, Xiamen port extends its functions to inland areas by holding promotion conferences and building land port.

In 2015-2019, Xiamen Port completed the container sea-rail intermodal transport volume from 18.3 thousand TEUs to 36.7 thousand TEUs, with an average annual growth rate of 19.00%, and the proportion of sea-rail intermodal transport increased from 0.20% to 0.33%.

Table 1. The container throughput and the throughput of container sea-rail intermodal transport of Xiamen port in 2015-2019.

	Container Throughput	Throughput of Container Sea-rail intermodal Transport	Proportion
Year	Million Teus	Million Teus	%
2015	9.18	18.3	0.20
2016	9.61	19.6	0.20
2017	10.38	25.4	0.24
2018	10.70	22.2	0.21
2019	11.12	36.7	0.33
Average annual Growth Rate（%）	4.91	19.00	13.44

2. The problems in the development of container sea-rail intermodal transport of Xiamen Port

2.1. Railway transportation

2.1.1. Slow development of transportation technology. Due to the lack of competition, the development of railway transportation technology in China is slow. At present, the main types of railway containers in China are 1t, 5T, 10t, 20ft and 40ft general purpose containers, which is not fully compliant the standardization of international containers and it is not possible to make a good connection in the process of container multimodal transport. And Xiamen railway station is not equipped with special container handling equipment, which lead to the container lifting, unloading and reloading are inefficiency[1].

2.1.2. Rigid transport price. Due to the railway freight rate is under the management of National Development and Reform Commission, and as the main body of market operation, China Railway Container Transportation Corp., Ltd. does not have the right to adjust the freight rate. The adjustment plan of railway freight rate needs to be reported at all levels and cannot be adjusted in time according to the market situation, which lead to lack of price means to participate in market competition.

2.1.3. Lack of special container handling station. At present, Xiamen port has not special container handling station and do not have specialized container handling machinery, which lead to irregular operation mode ,low loading and unloading efficiency, frequent case damage and long vehicle stay time. And the method of work is not allowed of going through the customs formalities directly in the inland area and check the lead seal at the port for direct release. As a result, the whole process of intermodal transportation is prolonged, which is not conducive to the turnover of customers' funds[2].

2.2. Port operation

2.2.1. Neglect of railway construction in port area. In the early years, the state and Fujian laid more emphasis on highway construction than railway construction in the construction of transportation infrastructure. As a result, the port railway branch lines in Xiamen Port have been abolished. And the railway facilities of Xiamen port are still very weak, so it is difficult to realize the sea rail intermodal transportation.

2.2.2. Separation of port and station. Xia Men Port Development Co., Ltd and Nanchang Railway Bureau jointly established the container terminal of Gaoqi north railway station, realized the “one window, one vote settlement” of container sea-rail intermodal transport business, and started the integrated operation of sea-rail intermodal transport.However, these ports and stations are actually in a state of separation of “port” and “station”. Trains have direct access to the port, and containers do not reach the “port” when they arrive at the “station”. There is still a need for transshipment between “port”

and “station”. There is a limited space for two times of loading and unloading and one time of container transportation, so the cost reduction is limited. If this problem is not solved, the transportation organization will be relatively extensive, the close connection between flights and trains will not be achieved, which will easily lead to transportation delay and container demurrage, affect the efficiency of intermodal transportation, increase the transportation cost, and make the sea-rail intermodal transportation of Xiamen port not competitive in terms of timeliness and freight rate[3-4].

2.3. Shipping transportation

In Xiamen port, because of the cost structure of container sea-rail intermodal transport and the nature of “sea” and “Rail” combined transportation, the main body of container sea-rail intermodal transport is the shipping company, and the enthusiasm of shipping company determines the scale of container sea-rail intermodal transport.Due to a series of factors such as poor inland transportation conditions, long container turnover time, high cost and risk of letter of credit, many shipping companies are not active in carrying out inland intermodal transportation.

2.4. Construction of information system for container sea-rail intermodal transport

Compared with the shipping information system, the railway information system is relatively backward, the railway system has not yet built a good container tracking management system, which lead to the owner of cargo can not grasp the real-time dynamic information of the container, and can not track the whole container transportation dynamically. In the aspect of import, it makes the manufacturers unable to make correct production arrangement for the import and export raw materials, which causes the delay of products entering the market. In the aspect of export, due to the long running time, it is often impossible to dock with the scheduled ships, so it can only be delayed to the next voyage, which makes customers have a great distrust of the railway trains. In addition, the information transmission system of sea-rail intermodal transport has not been built yet, which results in the low efficiency of information transmission of sea-rail intermodal transport, and there is a certain lag, which makes it difficult to carry out the business of each sea rail system efficiently.

3. The development strategy of container sea-rail intermodal transport of Xiamen Port

3.1. Improve the construction of Xiamen inland railway trunk line

Under the guidance of *Mid-Term and Long-term Railway Network Development Program of China* and *Mid-Term and Long-term Railway Network Development Program of Fujian Provinve*, and in combination with Xiamen's actual conditions, we should further deepen and improve the planning of modern collection and distribution platform and network system, speed up the construction of main railway lines from Xiamen to Hunan, Yunnan and Sichuan, speed up the construction of connecting Xiamen Port with other provinces and cities' railway lines, and improve and expand the railway in the east central region network and capacity, increase railway collection and distribution capacity.

3.2. Improve the construction of Xiamen inland railway trunk line

Promote the construction of port railway lines in Haicang free trade port and Zhaoyin and Gulei Port-centered Logistic Park. Accelerate the expansion project of port railway special line in Haicang District and the development and construction of Zhangzhou Zhaoyin and Gulei railway branch lines. Build a land port through sea rail intermodal operation platform, and let the railway channel extend to the end of Xiamen port collection and distribution system[5].

3.3. Build the operation platform for combined transport

On the one hand, on the basis of the construction of the railway branch line of Haicang free trade port area, the container yard and loading area shall be reconstructed in accordance with the requirements of the sea-rail intermodal transport, and the handling and handling equipment shall be improved, and the container freight base land port direct sea-rail intermodal transport operation platform suitable for the

rapid operation of the direct train shall be built.On the other hand, during the construction of "land port" in the future, special railway lines will be introduced to make the train directly reach the warehouse of "land port" and realize direct delivery with the train, so as to finally improve the efficiency of railway container train transportation organization and realize the true seamless connection of road-rail intermodal transport. At the same time, considering the road and railway transportation mode as a whole, improve the container handover process between the road and railway, realize the "no landing" operation between the truck and the train compartment, and improve the loading and unloading efficiency.

3.4. Paying attention to the source of goods for long-distance sea-rail intermodal transport

With inland freight station and "land port" as the center, attract shipping companies, inland operators of sea-rail intermodal transport and freight forwarding companies to settle in. Give full play to the key role of shipping companies in the selection of inland container ports, actively develop the sources of goods in hinterland areas such as Hunan, Guizhou and Yunnan, and take Xiamen port as the logistics node of their product sea rail intermodal transport business. Expand economic and trade cooperation with Taiwan, Southeast Asian countries and regions, especially cooperation and investment with local manufacturing industry, achieve the purpose of mutual cooperation and promotion while expanding the scale of sea rail intermodal logistics and freight volume, and actively cultivate more market sources of ASEAN for Xiamen port.

3.5. Strengthen the cooperative operation between the main bodies of sea-rail intermodal transport

On the basis of the existing good cooperation, further deepen the cooperation among railway departments, cities along the railway, national regulatory units and shipping companies, and improve the coordination mechanism, strengthen information communication, establish a regular joint meeting system, timely report the situation, reflect the problems and study the countermeasures[6].

3.6. Promote the information system construction of sea-rail intermodal transport

Promote the construction of information system framework for sea-rail intermodal transport, and automatically connect port operation system, railway in transit information and land port operation system. Complete information inquiry and dynamic tracking of the whole process of sea rail intermodal transport by many ways such as online query, SMS push and so on, and realize the openness and transparency of logistics information. Establish the whole supply chain system with functions of purchasing, trading, warehousing, financing, etc. Build a single service window, which can reduce the intermediate links, simplify the procedures, reduce the cost, and provide high-quality and efficient one-stop port logistics services for customers in the hinterland, thus fully realizing the information coverage of the whole process of sea-rail intermodal transport.

3.7. Build a quick and convenient customs clearance system

Build "enterprise comprehensive service system", optimize and integrate the business, logistics, customs clearance, payment and other related businesses by means of information technology, which can bring convenience to import and export enterprises. Promote E-port self-service remote customs declaration, further improve the measures for fast customs clearance such as "No paper" clearance, online verification of E-customs declaration forms, and centralized Customs declaration, which can shorten the time for customs clearance. Establish a "three ones" customs clearance management mechanism, which can achieve "one declaration, one inspection and one release" for import and export goods. It will further improve the efficiency of customs clearance and further reduce the operating costs of enterprises by introduct assistance measures[7].

4. Implementation plan

4.1. Strengthen organization and coordination mechanism

It is suggested that Office of Xiamen Coordination Group for the Development of Modern Logistics

Industry should be taken as the organization and coordination organization to expand the economic hinterland and develop sea-rail intermodal transport, which promote the works of sea-rail intermodal transport of Xiamen Port. The leader in charge of each relevant department and district government (Management Committee) shall be the member, and the special person of business department shall be designated as the contact and working group member. Each leading responsible department and unit shall actively implement the work plan, plan investment projects and carry out investment promotion to promote industrial development. And it should be report the work summary, investment promotion and construction progress report of sea-rail intermodal transportation to Office of Xiamen Coordination Group for the Development of Modern Logistics Industry in ten days before the end of each quarter

4.2. Cultivate leading enterprises

Strengthen the cultivation of enterprises which focus on sea-rail intermodal transport business, such as Xia Men Port Development Co., Ltd, Xiamen Container Terminal Group, Xiamen Haicang Invsetment Group Co., Ltd and so on. Establish a docking mechanism to timely study and coordinate the solutions to the difficulties and problems encountered in the process of enterprise development. Establish the special industrial support funds and other policies to assist leading sea rail intermodal enterprises in expanding and improving sea rail intermodal service network, business expansion and promotion, business process reengineering and informatization, business form and model innovation, listing financing, talent introduction, etc. And which can enhance the brand effect of the enterprise, build a national famous brand, give full play to the leading demonstration effect of leading enterprises, promote the further integration of logistics resources and optimize the industrial structure, and accelerate the transformation and upgrading of logistics industry.

4.3. Strengthen investment promotion

Strengthen combing the main enterprises operating the sea-rail intermodal transport business in Xiamen port. Focus on investment promotion of land port project, multimodal transport platform, sea rail transport business, and railway channel and land transport hub project construction. Establish an investment promotion mechanism to coordinate investment promotion in the fields of information collection, merchant's invitation, external publicity, visit promotion, business guidance, policy support, etc. Make full use of "9.8" investment fair, channel logistics Festival, various promotion conferences and other communication and cooperation platforms to attract investment. Every district government shall lay down investment objectives, work plans, priorities, and complete project investment promotion and docking, which can ensure high quality projects are implemented as soon as possible.

4.4. Increase capital investment

It is suggested to increase the investment proportion of Xiamen guiding fund for service industry development and industry guidance fund in Xiamen port's operation of sea-rail intermodal transport business project. And use the guiding funds to increase the support for the sea-rail intermodal transport service platform project.

4.5. Speed up personnel training

Xiamen Port must pay attention to the training of sea-rail intermodal transport and should scientifically and reasonably solve the talent problems that may be involved in the development of the next few years through institutional measures. It will be realized that the great development of sea-rail intermodal transportation by giving full play to the role of talents.

5. Concluding remarks

Xiamen Port should fully seize the opportunity of the construction of "the Belt and Road" and national logistics hub construction, and find out the problems existing in the development of sea rail intermodal transport. It is not only necessary for the government to strengthen the construction of infrastructure and development platform of sea-rail intermodal transport, but also for the market to improve the awareness

and recognition of sea-rail intermodal transport. So then, it will realize the intensive, integrated and green development of sea-rail intermodal transport.

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