The New Concept of Fifth Generation Port And Navigation Engineering

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Abstract: This paper puts forward the concept of port and navigation engineering of the fifth generation. Starting from the concept of port, it points out that port has gone through the change from the first generation port to the fourth generation port, and now it has entered the stage of the fifth generation port. The main functions of the fifth generation port include the functions of the previous four generations, while it also focuses on the combination of port city and port town, and its main characteristics are efficiency, ecology and low carbon. Then it puts forward the concept of ecological port and navigation in narrow sense and broad sense. In the narrow sense, the ecological port and navigation refers to the ecological port of the fifth generation port above the third and fourth generation ports and the ecological channel centered on the ecological port. In the broad sense, ecological port and navigation refers to the port and navigation system that combines ecological port, ecological channel, ecological port city and ecological village. The fifth generation port and navigation engineering is the port and navigation engineering corresponding to the fifth generation port, ecology is its most important feature, which is the new promotion of port and navigation engineering concept.

1. Introduction
Around the world, on the ecological ports, port of Sydney harbour, long stand close to ecological ports, port in China in recent 10 years in the port throughput and container throughput in the world, but with European countries on ecological ports and ports, especially in Sydney harbour, long stand port has much difference, which is one of China's effort should be made to the direction of the port construction. The world port and navigation construction has entered a new stage, that is, the fifth generation port and navigation construction, which corresponds to the birth of the fifth generation port and navigation project.

2. The proposal of the fifth generation port and navigation project
The discussion on the concept of ecological port and navigation engineering starts from the concept of port. With regard to the concept of ports, according to the analysis of the United Nations conference on trade and development, the changes from first-generation ports to fourth-generation ports have been made:

The first generation of port refers to the port before 1950, its function for the shipping goods transport and temporary storage and sending and receiving of goods, port is an interface between sea transportation and inland transportation, whose character is: (1) with separate transportation activities,
business activities, is just a place, the transfer of goods and function is the transfer of goods between the ship shore; (2) it regards itself as an independent place with few partnerships with local governments or even with shipping customers; (3) the different operations in the port are isolated from each other; (4) at that time, the port was mainly for transshipment of general cargo and bulk cargo.

The second generation of the port is refers to the 80 s and 1950 s, this generation of port besides has the function of the first generation of port, increased transportation loading and unloading and service for commercial and industrial sites, whose character is: (1) in addition to directly provide freight, loading and unloading services to the customers, at the same time also provide related services in the industry and commerce; (2) able to consider port policies and development strategies from a broad perspective and adopt advanced management concepts and methods; (3) to add industrial and service facilities within the port area; (4) forming a partnership between transport and trade to allow shippers, especially large shippers, to set up cargo handling facilities in the port area; (5) to establish relatively close relations with local parties concerned.

The third generation port is the port which became the logistics center in 1980s and 1990s. This generation of ports not only have the functions of the first generation and the second generation of ports, but also strengthen the connection with the cities and users, so that the port's services go beyond the previous limits, and add comprehensive services such as transportation, trade information service and cargo distribution, so that the port becomes a logistics center. It is formed under the mutual promotion and common development of international trade, containerization and multimodal transport. Its characteristics are as follows : (1) the port gradually becomes the hub of international production and circulation network, and its operation and management are more proactive; (2) on the original basis, the port business continues to be specialized, integrated and more flexible; (3) simultaneously consider the planning and construction of information processing facilities in the planning and construction of port infrastructure; (4) attaching importance to value-added services for primary products. In addition to value-added loading and unloading and industrial value-added services, the logistics center can also carry out the following value-added services: goods inventory and moving information services, container, crate and pallet packaging services, packaging tightening, marking, weighing and repackaging services.

The fourth generation port is from 1990s to 2010, which is an information-based and flexible port of the Hong Kong and maritime alliance and the international alliance. Generation port before including three generation function, and is the main port and waterway and port to the league goods processing are mainly on the basis of large-scale, highly informationization and network at the same time should also meet the demand of market, flexible, agile, also has production is characterized by: (1) the alliance between the alliance between ports and port. A network of terminals operated by some port operators is forming, which is very conducive to the coordination and interaction between ports. (2) the interaction between ports and shipping and their related logistics activities is very important in the construction of a seamless supply chain. (3) the informatization, networking and agility of the port enable the port to respond quickly to the market demand in an agile manner and meet the various differentiated and personalized needs of customers.

The first to four generations of ports have largely ignored sustainable development and climate change, which are among the greatest challenges facing humanity today. Therefore, I put forward the fifth generation port, the so-called fifth generation port refers to the ecological port. The period is from around 2010 to the next 20 years. Its main functions include the functions of the previous four generations of ports, while it also focuses on the combination of port city and port town, its main characteristics are efficiency, ecology, low carbon

Worth pointing out that the development of port and waterway engineering is basically consistent with the development of the five dynasties in front of the port, the port is in each generation contains corresponding with the port on the basis of the corresponding development of port and waterway engineering, that is to say the world port and waterway engineering is correspondingly accordingly with five generations port of the five dynasties to the development of port and waterway engineering.
3. The concept of the fifth generation port and navigation engineering

The concept of the fifth generation port and navigation engineering is divided into narrow sense and broad sense:

In the narrow sense, the fifth generation port and navigation engineering refers to the ecological port engineering of the fifth generation port above the third and fourth generation ports and the ecological waterway engineering centered on the ecological port. In a broad sense, the fifth generation port and navigation project refers to the port and navigation system project combining ecological port, ecological channel, ecological port city and ecological village. This port is ecological port, waterway here is ecological channel, it will ports of Marine environmental damage down to a lower, reduced carbon emissions, make port a ecological port, to bridge waterway construction and the construction of ecological river, the formation of flood discharge and water logging drainage, irrigation, shipping, breeding, tourism, a variety of functions in an efficient ecological waterway, port city and the village become a ecological city and ecological towns and villages. Cities and towns along the port and waterway have built ecological economic belt, cultural belt, scenery belt and tourism belt, with beautiful landscape, fresh air, and the environment to adapt to, and natural scenery coordination, and the growth of animals, plants, creatures and harmony. Moreover, it can improve, purify and protect the environment along the port and waterway, and can adjust the ecosystem automatically. Ecological port engineering, ecological waterway engineering, ecological city engineering, ecological village engineering and ecological ship engineering promote and integrate with each other. The most important point is the high efficiency, sustainability, ecology and low carbon of networklization.

4. Conclusions

To sum up, the main conclusions of this paper are as follows: first, the world port and navigation construction has entered a new stage, that is, the construction of the fifth generation port and navigation, which corresponds to the birth of the fifth generation port and navigation project.

Second, put forward the concept of the fifth generation port and navigation project. Third, the fifth generation port and navigation engineering in the narrow sense refers to the ecological port engineering of the fifth generation port above the third and fourth generation ports and the ecological waterway engineering centered on the ecological port. Fourth, it puts forward that the generalized ecological port and navigation engineering refers to the port and navigation system engineering combining the ecological port engineering, ecological waterway engineering, ecological port city engineering and ecological village and town engineering. Fifth, it is pointed out that ecological port engineering, ecological waterway engineering, ecological city engineering, ecological village engineering and ecological ship engineering promote and integrate with each other, which will push port and navigation engineering construction to a new stage.

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