Analysis the Mechanism of Green Shipbuilding Supply Chain and Index System

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Abstract. With the development of shipbuilding industry, "Green Ship" design and construction will play the leading role in the future , to keep long-term and healthy development, we must carry out the green shipbuilding, and change the ship models .Environmental problems bring more and more restrictions on which. Therefore, to bring in the “green” concept into the shipbuilding industry is imperative. So, the paper Analysis the Mechanism of green shipbuilding supply chain and the construction of green evaluation index based on the view of society, economy and ecology.

1. Preface

At present, the green ship technology has become increasingly competitive in the green wave world widely. But, in recent years, International Maritime Organization introduces a series of new rules and standards, such as the International Ship Recycling Convention, new NOx/SOx emission standards, new-ship Energy Efficiency Design Index (EEDI), the new coating standard (PSPC), forced to raise the noise level of new vessels, and standard for corrosion Protection for tankers.
Green shipbuilding is the trend in the future, so shipyards should speed up green transformation so as to seize the commanding height in the future competition.

2. The Mechanism of Green Shipbuilding

Green ship manufacturing technology considering have minimal impact on the environment in ship manufacturing process and have the highest resource utilization rate. Through using the advanced technology, which can meet the user requirements, can save resources and energy, can reduce the pollution of the environment and give the workers good protection.

3. The Construction of System of Green Shipbuilding Supply Chain

System of Green shipbuilding supply chain covers all the nods associated with shipbuilding industry chain, which includes green procurement, green shipbuilding, green marketing and green recycling, etc. As show in Figure 1.

To realize the Green Shipbuilding supply chain, the designer must have a good awareness of the environment, choose the green materials from the design and improve material utilization in the design process we should adopted green materials widely and consider material utilization during the processing.

Green shipbuilding place the core role in green shipbuilding supply chain, which including non-traditional machining techniques, rapid prototyping technology, agile manufacturing technology ,green welding and cutting technology, green coating technology, green heat technology, green casting technology, surface modification technology, and green packaging technology, etc.

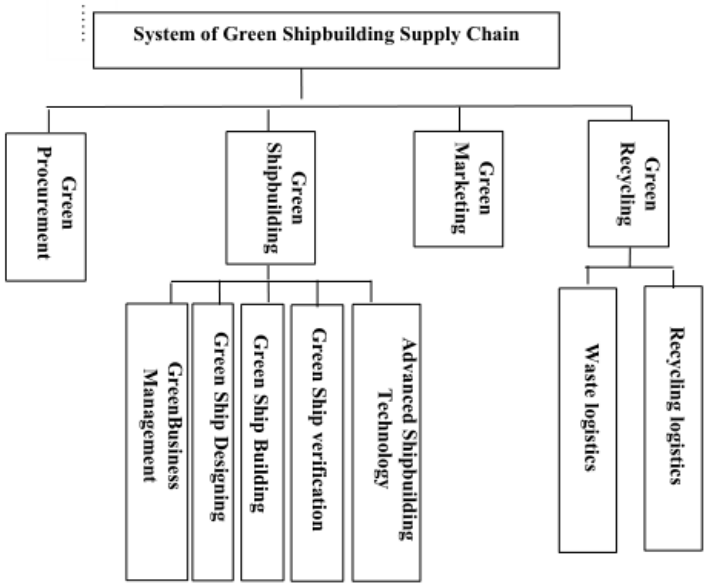

Fig1 Green Shipbuilding Supply Chain Operation System

Table 1 Green Grade Evaluation

The green grade evaluating indicators for the green shipbuilding supply chain management	Economy evaluation system	Income increase indicator	rate of profit increase
			rate of sales proceed increase
		Productivity enhance indicator	the capability of enterprise innovation the capability of science and technology transform to productivity The extent of green technology using
		Cost expenses indicator	line operation expense and cost reclaim expense and cost drain contamination and reprocessing expense and cost
		Asset expenses indicator	financial net present value rate of return on investment turnover of inventory stock net worth average accounts receivable turnover ratio The ratio of monetary assets loan and total investment
	society evaluation system	Enterprise influence indicator	market share market popularity customer loyalty index
		Enterprise contribution indicator	The ratio of socially useful activity The ratio of green contribution Tifu educational expenditure
		Enterprise culture indicator	enterprise green culture the green consciousness staff staff quality and age structure
	Ecology evaluation system	environmental indicator	Cleaning productivity the three wastes drain contamination Achievement Ratio the percentage that environmental protection investment occupies in total value of out-put
		Resources indicator	Resource economy ratio Resource synthetical utilization ratio Resources cycle utilization rate
		Energy indicator	Energy yield ratio Energy conversion ratio average energy consumption everyday

4. Green Evaluation Index

The green evaluation index quantize the harmonious extent of society, economy and ecology. It quantizes the extent of the human resources investment, the extent of the production, the extent of the environmental influence from the aspects of socioeconomic performance, resource and environment.

The green evaluation index of the green shipbuilding supply chain measures the action of every node and the influence for the natural ecology synthetically in the whole society macroscopic view.

The green evaluating indexes system for the green shipbuilding supply chain not only measures the influence of the shipbuilding individual action to the economy and society, but also considers the influence of the shipbuilding individual action to resource and environment. This system is as the Table 1 bellow:

5. Summary

The paper researched the structure of green shipbuilding supply chain and constructed green evaluation index based on the view of society, economy and ecology. The purpose is to play a guiding role for the shipbuilding enterprises, so as to promote the sustainable development of marine industries.

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