CRITERIA FOR EVALUATION THE TECHNOLOGICAL LEVEL OF SHIP PRE-OUTFITTING IN SHIPYARD

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Abstract

In today's highly competitive shipbuilding business, gaining a competitive advantage between shipyards is extremely important. In order to have a competitive and sustainable shipyard, it is important for the management to continuously monitor and raise the productivity, efficiency and quality of the production process. One of the major issues in today's shipbuilding is how to organise and conduct the efficient ship outfitting process as one of the most complex task within ship design, supply chain and production activities, particularly for high value-added ships. To be able to manage, improve and optimise ship outfitting process it is necessary to establish its current technological level and relevant activities. Hence, in this paper authors are analysing the ship outfitting process with special attention to ship outfitting prior to launching, with a purpose to define and explain the criteria to be used for such technological level evaluation.

Introduction

• The shipyards have to build quality ships, to enable a lower cost of the production process and to shorten delivery time of the ship.
• Shortening the time in the shipbuilding process by using the pre-outfitting concept is one way of reducing total ship production time and improving efficiency and cost performance.
• Though, pre-outfitting could be problematic for some shipyards and ship types due to obstacles in technological and production areas in shipyards.
• In this paper a particular criteria are analyzed using ship pre-outfitting in shipyards to evaluate their level of advance outfitting.
• The criteria will evaluate obstacles in shipyard such as shipbuilding preparation process, technological requirements and technological limitations through particular important sub-criteria.
• The result will be evaluation the level of pre-outfitting capabilities in observed shipyard and finding critical point that shall be improved to achieve higher level of advance outfitting usage which lead to shorten the time in ship outfitting process and reduce the outfitting cost.

Overview of outfitting process

In general, the process of ship outfitting is typically divided into two separated outfitting stages:
• pre-outfitting, otherwise known as advanced outfitting and
• on board outfitting

For pre-outfitting process is characteristically that it takes place in time almost simultaneously with the hull construction and is divided into two independent outfitting stages:
• on-block outfitting and
• on unit outfitting, otherwise known as modular outfitting

On board outfitting is also divided into two separated outfitting stages:
• on board outfitting up to the launching and
• final outfitting that is performed on board after launched.

Criteria for evaluation the level of ship pre-outfitting

The criteria for evaluation the level of pre-outfitting is divided in three main criteria: criterion for evaluation the shipbuilding preparation process, criterion for evaluation the technological requirements and criterion for evaluation the shipyard's technological limitations. Each criterion is divided in particular sub-criteria as follows:

Conclusion

Pre-outfitting is a way to shorten the time of the shipbuilding process and reduce costs, without investment in new facilities, machines and tools, and may increase competitiveness of shipyard.

Following this research, it is possible to evaluate, manage and improve outfitting process in shipyard. In doing so, it is proposed to primarily affect the following activities:
• maximising work during most productive stage of outfitting (On-block or On-board),
• minimising work during less productive stage of outfitting (On-board),
• maximising work under cover and so to be working place,
• minimising material handling and transport while minimising non-productive activities,
• maximising productivity of available manufacturing process,
• to source of necessary resources are readily available at work places and schedules (such as drawings, material, tools, facilities and manpower),
• to exploit benefit of engineering, material and production standards.

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