Development of real time integrated monitoring system for the improvement of offshore structure block logistics

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Abstract

How to efficiently manage offshore structure blocks at offshore yard has been a hot management issue in the offshore and engineering industry, because it has significantly influenced on the productivity of building process for offshore structure blocks. This paper introduces the real time integrated monitoring system for offshore structure block logistics in Hyundai Heavy Industries (HHI) and this study aims to diagnose logistics problems, propose possible solutions, and develop a monitoring system in order to search ways of improving for logistics management of offshore structure block. As a whole, this study tested the possibility and gained an insight in extending the functions of real time integrated monitoring system for offshore structure blocks.

Keywords: integrated morning, logistics management, offshore structure blocks
I. Introduction

II. Algorithm

III. Real time Monitoring system

IV. Conclusion
I. Introduction

- **OSBs (Offshore Structure Block) & Transportation**
  - To store an incoming OSB
  - To retrieve a due OSB
  - To replace the obstructive OSB to other empty cells
I. Introduction

- **Assignment problem**
  - Min # of OSBs moves within yard
## II. Algorithm

### Design of OSBs Assignment Methodology

<table>
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<tr>
<th>Sit.</th>
<th>Description</th>
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| 1    | - Retrieve all the due OSBs from the yard  
- Place the incoming OSBs according to a random order  
- **The storage locations for the obstructive and incoming OSBs are randomly assigned** |
| 2    | - Retrieve all the OSBs from the yard  
- Place the incoming OSBs according to a random order  
- **The storage locations to the obstructive and incoming OSBs are assigned by the OSBs storage location assignment algorithm** |
| 3    | - Retrieve all the due OSBs from the yard  
- Place the incoming OSBs according to a random order  
- **Placed the incoming OSBs according to the decreasing order of length of stay** |
II. Algorithm

• Two kinds of OSBs moves

(1) The necessary OSBs moves
: productive activities that move in and out OSBs

(2) The obstructive OSBs moves
: unproductive activities that replace obstructive OSBs to other empty cells

* Productivity ↑

\[ = \frac{O/N}{ratio} \downarrow = \frac{\# \text{ of obstructive OSBs moves}}{\# \text{ of necessary OSBs moves}} \]
III. Real time Monitoring

- Implementation of OBMS (Offshore Block Management Structure)
  - Show yard arrangement results graphically
  - Manage moving history & dispatching of OSBs
III. Real time Monitoring

- **OSB (Offshore Structure Block) Assignment**
  - Block location monitoring (based on GIS)
  - T/P location & moving direction monitoring

Result of retrieving OSM
III. Real time Monitoring

- Integrated monitoring system
  - Real time yard monitoring
  - Road monitoring for safety control
  - Work schedule & order
V. Conclusion

● Achievements

- Formalized the OSBs storage location assignment problem
- Developed the OSBs storage location assignment algorithm
- Implemented real time monitoring system

● Effects of study

- Diagnose OSBs logistics problems
- Develop a real time monitoring system in order to search ways of improving for logistics management of OSBs
- Test the possibility and gained an insight in extending the functions of real time integrated monitoring system for OSBs