

HANSA



INTERNATIONAL MARITIME JOURNAL

12|2015

SCHIFFBAU

Batterie- & Hybridantriebe
LNG-Umbau
Behördenschiffe

HANSA-FORUM

SCHIFFFAHRT | FINANZIERUNG
Von Lemmingen und dem
Konsolidierungsdruck

HÄFEN & OFFSHORE

Nadelöhr Hinterland
Terminal-Produktivität
Offshore-Forschung



Dezember 2015 | 152. Jahrgang
ISSN 0017-7504 | C 3503 E | € 14,80

www.hansa-online.de



BUREAU VERITAS S.A.
Zweigniederlassung Hamburg
Marine Department

Veritaskai 1, 21079 Hamburg
Tel.: +49 40 23625-0
Fax: +49 40 23625-620
E-Mail: ger_cha@de.bureauveritas.com

Visit us on: www.bureauveritas.de
www.veristar.com



**BUREAU
VERITAS**

Move Forward with Confidence

Marine | Industry | Inspection & In-Service Verification | Health, Safety & Environment | Construction
Certification | Consumer Products Services | Government Services & International Trade

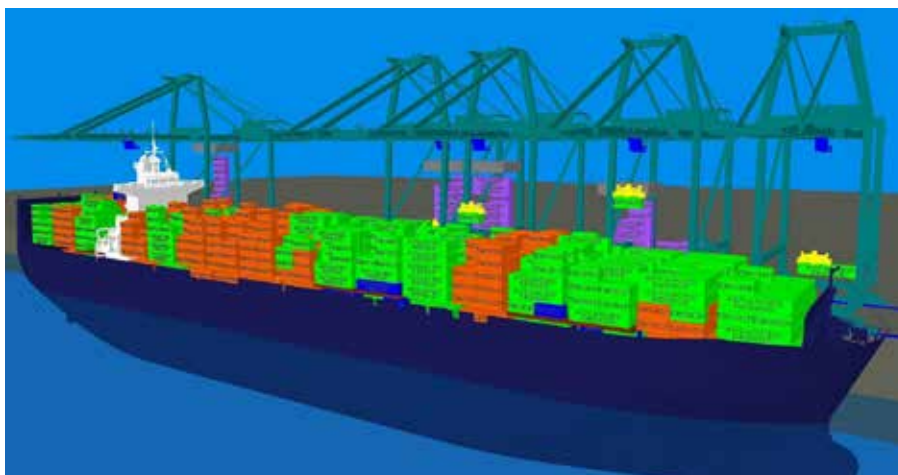
Simulation tools increase efficiency

Faster and more efficient port operations can allow vessel operators to better plan their journey and save fuel. An improved bay plan arrangement and a Discrete Event Simulation tool can help to improve terminal productivity

Container transportation has been increasing dramatically over the past decades leading us to several concerns regarding efficiency of container ships and ports operations. Moreover, after the downturn of the global economy in 2008, energy efficiency has become one of the main concerns for maritime operations. Fuel consumptions should be considered as major cost driver in merchant shipping. The simplest way to reduce this cost is to reduce ship speed, which is also called slow steaming.

Bearing in mind these two problems, a solution can be offered by improving operational efficiencies of container terminals. It can increase the service capacity of terminals, reduce operational time of the ships at port and minimize the problems faced due to congestions hence reducing operational expenses. Furthermore, for ship owners, improved container terminal efficiency can let the ships sail for smaller speeds by applying slow steaming strategy, which leads to save combustible as well as to decrease emissions.

Simulation of container terminal operations is a topic that has been studied since the 1970's and so far, various research cases have been carried out by using different methodologies. In our study case, we focused on the terminal productivity concerns of a new bay plan design for a container ship by using a Discrete Event Simulation (DES) model with a stochastic approach. What makes this approach most reliable is that it allows users to define all equipment existing in a container terminal,



GUI of the DES software during a simulation of five crane operation on a 4,250 TEU ship

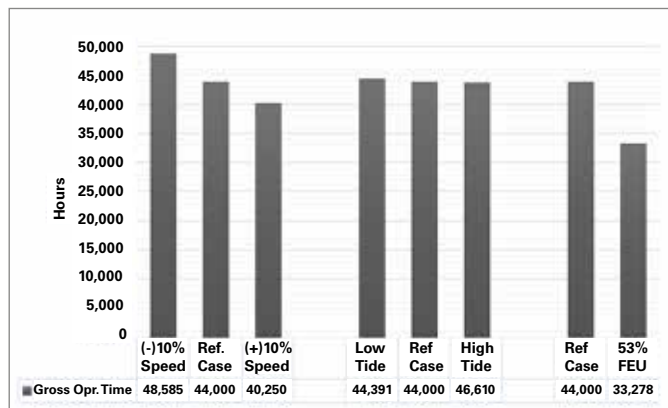
to state their physical features (speeds, accelerations, dimensions, locations, etc.) and most importantly to implement uncertainties (such as delays, breakdowns, etc.).

Even though container terminal operations can be highly automated, operational times still cannot be planned very accurately due to many complexities and it causes difficulties for planning the berth occupancy and operational time precisely. By using DES, these complications and the major characteristics of a container terminal can be incorporated into the simulation. Human-, equipment- and climate-related randomness can be introduced by using statistical data thus making it possible to create a system model that gives results closer to reality. For this case study, seven months of operational data have

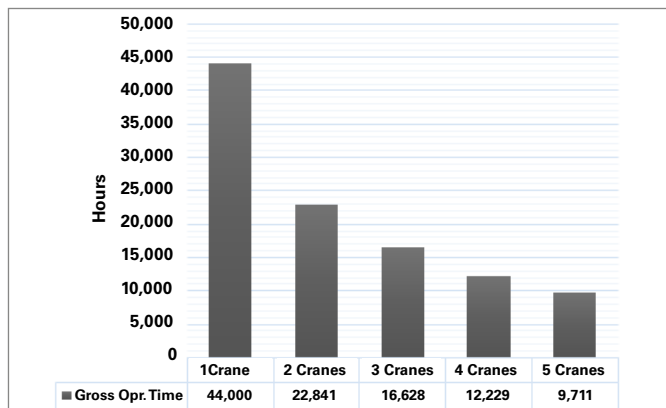
been obtained from a container terminal and statistical analysis has been conducted to generate delays statistical distributions for the simulation.

DES allows users to understand the attributes of the observed system and gives clear results about the bottlenecks of the operations. Similarly, it allows to analyse, without any investment, what is the possible throughput of different strategies or operation alternatives.

The simulation model is created fully parametrically, i.e. reading a database. Comparing other methodologies, it is way faster to perform a simulation. Moreover, it allows the possibility to connect the system to an optimizer. The simulation model has been calibrated and validated with real operation of several ships by respecting same



Effect of some physical changes on gross operational times with single crane operation



Effect of number of cranes on gross operational times

Source: Onur Sözen / University of Liege

crane allocation, hatch cover movements, different container sizes, etc. Results have shown a difference on gross operational time of about 1.5% between the real operation and the simulation. Gross operational time is defined as the total time spent in between handling first and last container, including idle times.

A new concept of bay plan arrangement of a 4,250 TEU container ship was also analysed. This case considers 1,200 TEU containers unloaded, 92 TEU containers re-handled (unloaded and loaded back due to hatch) and 15 hatch cover openings. The impact on various scenarios has been studied on the gross operational time of the terminal.

Firstly, sensitivity of some physical changes on the system are examined when a single crane operation is set up. A dramatic alteration in operational time is ob-

served, i.e. about 8.5%, when the speeds of cranes are increased or decreased by 10%. Besides that, it has been demonstrated that a tide variation of 0.5 m does not affect so much the operational time, i.e. less than 1% difference. Furthermore, using 53% of FEU containers on-board instead of only TEUs, gives the biggest differential with about 24% less operational time.

Decision on the crane number to be used in an operation is an important step which depends on the infrastructure of the terminal, the number of containers to be moved, the size of the ship, the availability of resources, the timing of the current operation and the planned date of a future operation.

This is an aid for a container terminal in deciding how many cranes to use for a specific operation case. For this instance, it can be observed that a difference of only 2.5 hours exists between a four crane and

a five-crane operation. This variation is relatively trivial compared to other time differences and the fifth crane can be redundant for this case.

The container terminal and the operator both presented high interest to use this tool to forecast and better schedule their operations. Better container bay plan arrangements and better scheduling at port side can lead to a significant improvement of terminal productivity, and consequently allow the ship owners to adopt slow steaming strategies.

Authors: **Rasih Onur Süzen (M.Sc.)**, under Erasmus Mundus EM-Ship fellowship in University of Liege, ronur.suzen@gmail.com

Prof. Jean-David Caprace (PhD), Federal University of Rio de Janeiro (UFRJ), jdcaprace@oceanica.ufrj.br

GVZ Bremen

Top-Platzierung gefestigt

Das Güterverkehrszentrum (GVZ) Bremen ist zum zweiten Mal im Rahmen einer Studie der Deutschen GVZ-Gesellschaft (DGG) in Kooperation mit dem Institut für Seeverkehrswirtschaft und Logistik (ISL) auf Platz zwei eingestuft worden. Der Vergleich umfasste mehr als 200 Standorte aus über 30 europäischen Ländern. Hinter Interporto Verona belegte das GVZ Bremen Rang zwei. Bereits im Jahr 2010 erreichten die Bremer den zweiten Platz in diesem Ranking.

In der diesjährigen Studie kamen sechs deutsche GVZ unter die Top 20 (Hinter Bremen belegte das GVZ Nürnberg Rang 3, gefolgt vom GVZ Berlin Süd auf Platz 4. Das GVZ Leipzig belegte Platz 9, das GVZ Berlin West Wustermark Position 17 und das GVZ Südwestsachsen wurde auf Rang 19 eingestuft. Insgesamt flossen 40 Kriterien in die Bewertung ein.

Die GVZ Entwicklungsgesellschaft Bremen (GVZe) sieht das »ausgezeichnete Abschneiden« des Bremer GVZ als Fortsetzung seiner Erfolgsstory und als Anerkennung der Standortvorteile. Inzwischen sorgen dort 150 Unternehmen mit insgesamt 8.000 Arbeitsplätzen für eine sehr hohe Beschäftigungswirkung. ■

Hamburger Hafen

Großschiffe jetzt rund um die Uhr im Fokus

Die Nautische Terminal Koordination (NTK) kümmert sich im Hamburger Hafen um die zentrale betriebliche Abstimmung der Großschiffsanläufe. Ab sofort arbeiten die Beschäftigten im Dreischichtbetrieb.

Die NTK wurde im Oktober 2014 von der Hamburger Hafen und Logistik AG (HHLA) und Eurogate gegründet. Sie unterstützt Hafengebiete, Reedereien und Behörden bei der reibungslosen Abfertigung der immer weiter steigenden Zahl von Anläufen sehr großer Schiffe in Deutschlands größtem Hafen. Darunter fallen nicht nur Containerschiffe, sondern auch Kreuzfahrt- und Massengutschiffe.

ECL/Green Cargo

Intermodale Kooperation

European Cargo Logistics (ECL), Tochtergesellschaft der Lübecker Hafen-Gesellschaft, und Green Cargo verknüpfen ihre Verbindungen. Bahnfracht-Operator Green Cargo bedient über 40 intermodale Terminals in Schweden und Norwegen. Zusammen mit den Intermodalverbindungen von ECL zwischen Deutschlands, Luxemburg, Frankreich, Spanien und Italien wird ein europaweites Intermodalnetz geschaffen. So soll es möglich sein, Trailer, Container oder Wechselbrücken auf einer Strecke bis zu 2.500 km von der Straße auf die Schiene zu verlagern. ■



Foto: Green Cargo