ADVANCES in MARITIME and NAVAL SCIENCE and ENGINEERING

3rd International Conference on MARITIME and NAVAL SCIENCE and ENGINEERING (MN '10)

Constantza Maritime University
Constantza, Romania
September 3-5, 2010
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Constantza Maritime University
Constantza, Romania
September 3-5, 2010
Editors:
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Preface

This year the 3rd International Conference on MARITIME and NAVAL SCIENCE and ENGINEERING (MN ’10) was held at the Constantza Maritime University, Constantza, Romania, September 3-5, 2010. The conference remains faithful to its original idea of providing a platform to discuss marine navigation, safety and security of maritime shipping, sea transport and transportation technology, hydrography, geodesy and marine cartography, geomatics and GIS in maritime applications, electronic chart systems ecs and ecdis, inland, river and pilot navigation systems, presentation of navigation-related information, route planning and monitoring; passage plan, integration of navigational systems, ins/ibs, e-navigation, GPS, galileo, GNSS and radio based navigational systems, telematics in maritime transportation, ships routeing and associated protected measures, maritime traffic engineering, systems of control, guidance and monitoring of traffic, VTS, manoeuvrability and hydrodynamics of ships, colregs, anti-collision, radar equipment, ARPA, AIS, VDR, maritime search and rescue issues, human factors, marine accidents, human errors, crew resource management, safe manning, stress and fatigue, navigational systems - the end user experience, marine simulation; full mission bridge, navigational simulators, maritime education and training; model courses validation etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors
# Table of Contents

<table>
<thead>
<tr>
<th>Plenary Lecture 1: Indoor Ambiences in Spanish Merchant Ships</th>
<th>Jose A. Orosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plenary Lecture 2: Oncoming Revolution for Ship Propulsion - Fuel Cells</td>
<td>Deniz Unsalan</td>
</tr>
<tr>
<td>Plenary Lecture 3: Combined Complex Maritime Simulation Scenarios for Reducing Maritime Accidents caused by Human Error</td>
<td>Eugen Barsan</td>
</tr>
<tr>
<td>Considerations about Effectiveness and Limits of Computer Based Training in Maritime Industry</td>
<td>Ghiorghe Batrinca, Gabriel Raicu</td>
</tr>
<tr>
<td>An Analysis of the M/Vs Anita and Norse Variant Distresses, in the Bermuda’s Triangle</td>
<td>Radu Hanzu Pazara, Cioara Petrica Ionel, Eugen Barsan</td>
</tr>
<tr>
<td>Three Dimensional Maritime Transportation Models</td>
<td>Eliodor Constantinescu</td>
</tr>
<tr>
<td>Considerations Regarding Kite Towed Ship’s Manoeuvering</td>
<td>Nicolae Grosan, Dumitru Dinu</td>
</tr>
<tr>
<td>Proposal of a Costs Simulator, for Traffics between Spain and the Black Sea</td>
<td>Manuel Rodriguez Nuevo, F. Xavier Martinez De Oses, Marcel La Castells</td>
</tr>
<tr>
<td>Maritime Piracy and Long Range Identification and Tracking</td>
<td>Liliana Viorica Popa</td>
</tr>
<tr>
<td>The Impact Behaviour of Composite Materials</td>
<td>Chircor Mihael, Dumitrache Ramona, Dumitrache Cosmin Laurentiu</td>
</tr>
<tr>
<td>The Use of Composite Materials in the Construction of Recreation Boats</td>
<td>Dumitrache Ramona, Dumitrache Cosmin Laurentiu, Chircor Mihael, Stan Liviu Constantin</td>
</tr>
<tr>
<td>Combustion Simulation for Naval Diesel Engine</td>
<td>Liviu Constantin Stan, Feiza Memet, Nicolae Buzbuchi</td>
</tr>
<tr>
<td>Analysis of the Ship Monitoring System – A Case Study for Constanta Port (Part 1)</td>
<td>Anastasia Varsami, Corina Popescu</td>
</tr>
<tr>
<td>Analysis of the Ship Monitoring System – A Case Study for Constanta Port (Part 2)</td>
<td>Anastasia Varsami, Corina Popescu</td>
</tr>
<tr>
<td>Analyzing of Risks During Tanker Operations at Off-Shore Terminals</td>
<td>Radu Hanzu-Pazara, Paulica Arsenie, Boyan Mednikarov, Blagovest Belev</td>
</tr>
</tbody>
</table>
Noise-Induced Hearing Loss for Maritime Navigating Personnel 79
Ninela Radulescu, Loredana Pazara, Hanzu-Pazara Radu Ioan, Cecilia Adumitresi, Cristina Farcas, Ileana Ion, N. Ceamitru, Carmen Ciufu, E. V. Radulescu

Maritime English – A Necessity for Nowadays Apprentices 83
Corina Popescu, Anastasia Varsami

Combined Complex Maritime Simulation Scenarios for Reducing Maritime Accidents Caused by Human Error 88
Eugen Barsan, Codrut Muntean

Towards a Romanian Maritime Cluster 94
Cristian Ianca, Ghiorghe Batrinca

Too Much Self Confidence - A High Contributing Human Factor in Maritime Accidents 100
Alina Lucia Bostina

Analysis of Transient Behavior During Starter Compensated of Asynchronous Motors Propellant in Low-Powered Electric Boats 104
Ricard Bosch-Tous, Pau Casals-Torrens, Ramon Grau-Mur, Eugen Barsan

Virtual Labs for Learning Electrical Machines in Marine Engineering 108
Pau Casals-Torrens, Ricard Bosch-Tous

Evaluation of Effective Forces on Perforated-Ball Velocity Meter (PVM) Using Inverse Problem of Morison Equation in Large Scale 113
Ehsan Ebrahimi Marzouni, Morteza Naghipour, Mojtaba Tajziehchi

Moodle Application for Reducing the Learning Time of Marine Engineers of Hydraulic Systems 120
Jose A. Orosa, Enrique J. Garcia-Bustelo

Spanish National Noise Standard in Maritime Transport 123
Jose A. Orosa, Jesus Alvarez

Energetical and Cavitation Analysis of a Network Profiles in Liquid Medium 126
Beazit Ali, Ionel Popa, Adrian Popa

Reducing Drag and Propeller Cavitation by Improving Vessel Wake 131
Beazit Ali, Ionel Popa, Mihai Bejan

The Effect of Green Algae as Natural Polymer in Enhanced Oil Recovery Processes 137
O. Arjmand, M. Kalbasi, A. R. Roostaee

Turbidity Determination Using Solar Broadband Models 144
Eftimie Elena

Estimating Clear Sky Solar Global Radiation Using Clearness Index, for Brasov Urban Area 150
Serban Cristina

Autonomous Hybrid Renewable Energy System 154
Mihai Tiberiu Lates, Catalin Alexandru
Solar Radiation Simulation for Clear Sky Conditions Using Linke Turbidity Factor for Brasov Urban Area
Coste Laura

160

Basic Principles For Ships Performance Ranking Merit
Luigi Iannone

164

A European Ecobono. Adressing the need of a joint solution for the European Transport System.
Juan Jose Usabiaga Santamaria

172

The Risk of Occupational Safety and Health in Shipbuilding Industry in Turkey
Ugur Bugra Celebi, Serkan Ekinci, Fuat Alarcin, Deniz Unsalan

178

Port State Control Inspections and Their Role in Maritime Security Specific Case – Romanian Naval Authority
Jaime Rodrigo De Larrucea, Cristina Steliania Mihailovici

186

Alejandro Leon Arias, Juan Jose Usabiaga Santamaria

192

Use of a Speed Log for the Detection of Sea Waves
Jaume Recolons, Josep M. Torrents

198

Forecast Sale of Goods Using the "BROWN" Method
Rozalia Nistor, Costel Nistor, Mihaela-Carmen Muntean

206

A Low Wash Hullform and Pollutant Free Inland Waterways Leisure Craft
Omar Yaakob, Mohd. Afifi Abd. Mukti, Ahmad Nasirudin

212

Neural Networks Based Analysis of Ship Roll Stabilization
Fuat Alarcin, Ugur Bugra Celebi, Serkan Ekinci, Deniz Unsalan

217

Guided Self-Supporting Gyroplane Used for Monitoring Coastal Area
Teodor-Viorel Chelaru, Mircea Cernat

221

Unmanned Aerial Vehicle for Surveillance and Autonomous Monitoring Coastal Area
Teodor-Viorel Chelaru, Vasile Nicolae Constantinescu, Eduard Popa, Adrian Chelaru

227

Authors Index

233
Plenary Lecture 1

Indoor Ambiences in Spanish Merchant Ships

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Abstract: The Spanish National Institute of Statistics reports that fatal accidents are substantially higher in commercial fishing fleets than in merchant shipping, although there are a significant percentage of Spanish merchant ships involved. According to casualty statistics, more than 60% of all engine room fires are initiated by hot spots. Oil leakages are usually not properly identified and corrected, a problem that must be related to marine engineers’ fatigue under extreme working conditions. In this regard, datasheets and standards do not provide clear information about the ambience suitable for the engine room, its design conditions, and the role of marine engineers in preventing work-related risks. Formal safety assessment is the first step in a new approach to maritime safety that involves using risk and cost-benefit assessment techniques to assist the decision making process. A new air conditioning control system based on general thermal comfort levels is a subsequent solution that will be presented.

Brief Biography of the Speaker:
Jose Antonio Orosa Garcia is a PhD in Marine Engineering and graduated in Marine Engineering and Naval Architecture from the University of A Coruna. His research is related to indoor ambiences and energy saving. In the recent past, he has participated in the International Energy Agency Annex 41 and collaborated with the University of Porto in research on energy saving and work risk prevention in indoor ambiences. Presently, he is Professor of HVAC and Head of the Department of Energy and Marine Propulsion of the University of A Coruna (Spain). He is a member of the Society of Naval Architects and Marine Engineers (SNAME) and ASHRAE.
Plenary Lecture 2

Oncoming Revolution for Ship Propulsion - Fuel Cells

Professor Deniz Unsalan
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Abstract: Fuel cells are electrochemical devices that produce electric current while oxidation of a fuel takes place. A classical fuel cell uses molecular hydrogen as the fuel and atmospheric air as the oxidant, and water vapour is the output. Since the efficiency of a fuel cell is not limited by the second law of thermodynamics and does not produce carbon dioxide, fuel cells are the candidate power systems of the future.

The history of fuel cells dates to mid-19th century. Interest has been revived in early 1960's as power sources for spacecraft. Several types of fuel cells have been developed in the recent decades, and applications to other areas have been made. The main problems for fuel cells are centered around the technical problems related to the storage of molecular hydrogen. However, hydrogen can also be in-situ obtained from a conventional hydrocarbon fuel by a reforming process.

Main marine applications of fuel cells for today have been for the air-independent propulsion of submarines and urban waterway transportation. However, the advantages offered by them has induced researchers to study fuel cells as power sources for ship propulsion and auxiliary services, which is the main topic of this presentation. Advantages to be obtained by the use of fuel cells from a ship designers and operators point of view are outlined, and as a candidate case, the concept for the power plant of a hypothetical frigate is explained.

Brief Biography of the Speaker:
Deniz Unsalan was born in Izmir, Turkey in 1953. He was educated in Ankara and Istanbul, receiving his undergraduate education from the Turkish Naval Academy in 1973. He served in the Turkish Navy ships before and after his postgraduate education. He received "Master of Science" and "Mechanical Engineer" degrees from the Naval Postgraduate School at Monterey, California in 1980. He was a British Council Scholar at the University of Newcastle upon Tyne, U.K. between 1982-1984. He received his Doctor of Philosophy degree in Naval Architecture in 1993 from the Istanbul Technical University. He was a lecturer in Marine Engineering at the Turkish Naval Academy between 1987 and 1994, Assistant Professor at Istanbul Technical University Maritime Faculty between 1994 and 1996, Associate Professor at Near East University between 1996-2003, at Dokuz Eylul University Institute of Marine Sciences and Technology between 2003-2009. He became a full Professor in 2006. Currently he is a Professor of Marine Engineering at the Piri Reis University in Istanbul, Turkey.
Abstract: Given the increasing prevalence of automated systems on board ships, it is important that the human element is considered throughout their design, implementation and operational use. Automation can be beneficial to operators of complex systems in terms of a reduction in workload or the release of resources to perform other onboard duties. However, it can also potentially be detrimental to system control through increasing the risk of inadvertent human error leading to accidents and incidents at sea.

A team of researchers from our Constantza Maritime University had participated at a study, together with master students, which wants to release the dangerous situation on sea based on human factors. In this scope has been used a full mission ship handling simulator with three full bridges and liquid cargo handling simulators, developing applications in navigation and ship handling area, with different grades of difficulty and risk. These applications brings the future deck officers in usually situations on board, forced to use the present navigation technology and study their options and reactions in these cases, focus on situations with risk of errors, human errors, appearance. Students had to navigate and maneuver very large vessels, as tankers, LPG or LNG vessels. Scenarios used in the research were very complex, combining near coastal navigation with piloting and anchoring or mooring operations. All these actions were done in real time and in different weather conditions.

Results of the study revealed the importance and benefits of a long term training of future deck officers, based on the use of modern and complex marine simulators, and the constant progress of the achievements of the trainees.

Brief Biography of the Speaker:
Dr. Eugen BARSAN graduate Naval Academy in Constantza, Romania in 1982. From 1982 to 1991 he sailed as deck officer in the Romanian merchant fleet, on different types of maritime ships. From 1991 his activities were related with the maritime education and training, teaching different nautical sciences at Constanza Maritime University. He completed is PhD in Surface Transport in 2004 defending his Doctoral thesis on "Oil Spill Prevention and Response along the Romanian Coastline" at Bucharest Technical University. In the last 18 years was appointed as Head of the Nautical Department, Vice Dean of the Maritime Transport Faculty of Constantza Maritime University. Now he is the Vice Rector for research and international cooperation at Constantza Maritime University. Dr. Barsan's primary areas of interest are: radar navigation, navigation and ship handling simulation, maritime safety and security, waterborne transport. Many of his research projects deal with optimization of maritime transport, analysis of human errors in navigation and ship handling, maritime traffic safety and control, man-machine interface in waterborne transport. He is member of the International Association of Maritime Universities (IAMU) and of the International Maritime simulation Forum (IMSF). Acting also as Director of the Constantza Maritime University Simulation Center, he is managing the development of the maritime simulation facilities and supervising the research activities that are applying simulations and on site experiments.
## Authors Index

<table>
<thead>
<tr>
<th>Author</th>
<th>Page Numbers</th>
<th>Author</th>
<th>Page Numbers</th>
<th>Author</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adumitresi, C.</td>
<td>79</td>
<td>De Oses, F. X. M.</td>
<td>34</td>
<td>Naghipour, M.</td>
<td>113</td>
</tr>
<tr>
<td>Alarci, F.</td>
<td>178, 217</td>
<td>Dumitrache, C. L.</td>
<td>45, 51</td>
<td>Nasirudin, A.</td>
<td>212</td>
</tr>
<tr>
<td>Alexandru, C.</td>
<td>154</td>
<td>Dumitrache, R.</td>
<td>45, 51</td>
<td>Nistor, C.</td>
<td>206</td>
</tr>
<tr>
<td>Alvareaz, J.</td>
<td>123</td>
<td>Dumitrue, D.</td>
<td>28</td>
<td>Nistor, R.</td>
<td>206</td>
</tr>
<tr>
<td>Arias, A. L.</td>
<td>192</td>
<td>Eftimie, E.</td>
<td>144</td>
<td>Nuevo, M. R.</td>
<td>34</td>
</tr>
<tr>
<td>Arjmand, O.</td>
<td>137</td>
<td>Ekincl, S.</td>
<td>178, 217</td>
<td>Orosa, J. A.</td>
<td>120, 123</td>
</tr>
<tr>
<td>Barsan, E.</td>
<td>21, 88, 104</td>
<td>Farcas, C.</td>
<td>79</td>
<td>Paulica, A.</td>
<td>73</td>
</tr>
<tr>
<td>Batrinca, G.</td>
<td>15, 94</td>
<td>Garcia-Bustelo, E. J.</td>
<td>120</td>
<td>Pazar, L.</td>
<td>79</td>
</tr>
<tr>
<td>Beazit, A.</td>
<td>126, 131</td>
<td>Grau-Mur, R.</td>
<td>104</td>
<td>Popa, A.</td>
<td>126</td>
</tr>
<tr>
<td>Bejan, M.</td>
<td>131</td>
<td>Grosan, N.</td>
<td>28</td>
<td>Popa, E.</td>
<td>227</td>
</tr>
<tr>
<td>Belev, B.</td>
<td>73</td>
<td>Hanzu-Pazara, R. I.</td>
<td>21, 73, 79</td>
<td>Popa, I.</td>
<td>126, 131</td>
</tr>
<tr>
<td>Bosch-Tous, R.</td>
<td>104, 108</td>
<td>Ianca, C.</td>
<td>94</td>
<td>Popa, L. V.</td>
<td>39</td>
</tr>
<tr>
<td>Bostina, A. L.</td>
<td>100</td>
<td>Iannone, L.</td>
<td>164</td>
<td>Popescu, C.</td>
<td>61, 67, 83</td>
</tr>
<tr>
<td>Bußbuchi, N.</td>
<td>57</td>
<td>Ion, I.</td>
<td>79</td>
<td>Radulescu, E. V.</td>
<td>79</td>
</tr>
<tr>
<td>Casals-Torrens, P.</td>
<td>104, 108</td>
<td>Ionel, C. P.</td>
<td>21</td>
<td>Radulescu, N.</td>
<td>79</td>
</tr>
<tr>
<td>Ceamitru, N.</td>
<td>79</td>
<td>Kalbasi, M.</td>
<td>137</td>
<td>Raicu, G.</td>
<td>15</td>
</tr>
<tr>
<td>Celebi, U. B.</td>
<td>178, 217</td>
<td>La Castells, M.</td>
<td>34</td>
<td>Recolons, J.</td>
<td>198</td>
</tr>
<tr>
<td>Cernat, M.</td>
<td>221</td>
<td>Lates, M. T.</td>
<td>154</td>
<td>Roostae, A. R.</td>
<td>137</td>
</tr>
<tr>
<td>Chelaru, A.</td>
<td>227</td>
<td>Liviu, C. S.</td>
<td>51, 57</td>
<td>Santamaria, J. J. U.</td>
<td>172, 192</td>
</tr>
<tr>
<td>Chelaru, T.-V.</td>
<td>221, 227</td>
<td>Marzouni, E. E.</td>
<td>113</td>
<td>Serban, C.</td>
<td>150</td>
</tr>
<tr>
<td>Chircor, M.</td>
<td>45, 51</td>
<td>Mednikarov, B.</td>
<td>73</td>
<td>Tajziehchi, M.</td>
<td>113</td>
</tr>
<tr>
<td>Ciufu, C.</td>
<td>79</td>
<td>Memet, F.</td>
<td>57</td>
<td>Torrents, J. M.</td>
<td>198</td>
</tr>
<tr>
<td>Constantinescu, E.</td>
<td>25</td>
<td>Mihailovici, C. S.</td>
<td>186</td>
<td>Unsalan, D.</td>
<td>178, 217</td>
</tr>
<tr>
<td>Constantinescu, V. N.</td>
<td>227</td>
<td>Mukti, M. A. M.</td>
<td>212</td>
<td>Varsami, A.</td>
<td>61, 67, 83</td>
</tr>
<tr>
<td>Coste, L.</td>
<td>160</td>
<td>Muntean, C.</td>
<td>88</td>
<td>Yaakob, O.</td>
<td>212</td>
</tr>
<tr>
<td>De Larrucea, J. R.</td>
<td>186</td>
<td>Muntean, M.-C.</td>
<td>206</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>