

# Table of Contents

## Preface

## Chapter 1: Materials, Mechanisms and Energy of Technical Systems and Devices

<b>Analysis of the State of Stress in the Hull of the Ship Kormoran II Loaded with Non-Contact Mine Explosion</b> B. Szturomski, A. Grządziela and R. Kiciński	3
<b>Assessing Energy Efficiency of High Pressure Regenerative Feedwater Heaters in a Heating Unit of a Cogeneration Plant</b> B. Pojawa	14
<b>Cylindrical Gears with Increased Contact Area – Proposal of Application in Watercrafts Power Transmission Systems</b> M. Batsch, T. Markowski and W. Homik	26
<b>Dynamic Characteristics of High Quality Steel in Johnson-Cook's Model for Fast Processes Simulation in CAE Programs</b> B. Szturomski	31
<b>Dynamic Model of Carbon Fiber Drive Shaft</b> Z. Dąbrowski and P. Deuszkiewicz	39
<b>Exploitation Load Impact on Electrochemical Properties of Shipbuilding 7xxx Series Aluminum Alloy Joints Prepared with TIG and FSW Methods</b> W. Jurczak	53
<b>Simulation Studies of the Effect of Shaft's Nonlinear Flexural Stiffness Parameters for Critical States of Rotating Power Transmission Systems</b> T. Matyja and B. Łazarz	62
<b>State of Stress Analysis for Structural Solutions of Combustion Engine Piston Pins</b> P. Folega, R. Burdzik and Ł. Konieczny	70
<b>Temperature as a Source of Information about the Technical Condition Viscous Torsion Damper</b> W. Homik and T. Markowski	78
<b>The Numerical Analysis of Influence of Crankshaft Main Spindles Regeneration in Marine Engine on Stiffness and Eigenfrequency of the Crankshaft</b> J. Merkisz, J. Markowski, J. Kaluzny and R. Roszak	85
<b>The Selection of the Parameters of Laser Beam for Constitution of the Corrosion Resistant Surfaces in Parts of the Rubber Vibration Damper</b> B. Ciecńska, W. Homik and Z. Matuszak	93
<b>Analysis of Power Installed in Ship Power Plants of Offshore Type Vessels</b> A. Adamkiewicz	98
<b>Analysis of the Possibility of Use Lithium - Ion as a Starting Battery on the Ship Engine Room</b> G. Grzeczka and P. Swoboda	106
<b>Simulation Model of Four Stroke, Six Cylinder Marine Diesel Engine</b> M. Kluczyk and A. Grządziela	113

## Chapter 2: Control and Robotics

<b>Control-Oriented Model of Biomimetic Underwater Vehicle Motion</b> P. Szymak and T. Praczyk	121
<b>Determination and Display of Safe Ship Trajectories in Collision Situations at Sea</b> J. Lisowski	128
<b>Moving Object Detection, Localization and Tracking Using Stereo Vision System</b> B. Żak and S. Hożyń	134

## Chapter 3: Diagnostics of Equipment

<b>Analysis of Action Viscous Torsional Vibration Damper of the Crankshaft Based on Transverse Vibration the Engine Block</b> J. Dziurdź and R. Pakowski	145
<b>Application of a Continuous Wavelet Transform for the Diagnosing of Excessive Valve Clearance of the Combustion Engine</b> T. Figlus and A. Wilk	153
<b>Application of HFRT Methods to Diagnose the Technical Condition of High-Speed Marine Diesel Engines</b> T. Lus	161
<b>Characteristics Determination of LM-2500 Naval Gas Turbine in Aspect of Energy Modeling and Simulations</b> B. Pojawa	169
<b>Concept of Engine Vibration Monitoring System</b> R. Burdzik, P. Folega, Ł. Konieczny and J. Młynczak	180
<b>Energy Loss and the Choice of Damper of Torsional Vibration Combustion Engines</b> M. Zawisza	188
<b>Identification of Engine Operation States Using Advanced Signal Analysis Methods</b> Ł. Konieczny, R. Burdzik, P. Folega and J. Młynczak	196
<b>Influence of the Instantaneous Angular Speed (IAS) of Marine Diesel Engine on its Indication Results</b> M. Łutowicz and D. Cuper-Przybylska	204
<b>Problems of Mathematical Modeling of the Marine Diesel Engine Working Cycle for the Diagnostic Purposes</b> A. Cwalina, T. Kniaziewicz and M. Zacharewicz	212
<b>The Choice of Vibroacoustic Signal Measures in Mechanical Fault Diagnosis of Diesel Engines</b> Z. Dąbrowski and M. Zawisza	220
<b>Toothed Gear Dynamic Model as a Tool for Assist Diagnosis its Technical Condition</b> G. Peruń	228

## Chapter 4: Environment Protection Engineering

<b>Analysis of Economic Costs and Environmental Benefits of LNG as the Marine Vessel Fuel</b> M. Pawlak	239
<b>Analysis of Gaseous Degradation Products Occurring during Biomass-to-Liquid Processes</b> E. Rostek	247
<b>Mathematical Description of the Trajectory of Vessel Motion in Order to Determine Emission of Harmful Compounds in Exhaust Gases</b> T. Kniaziewicz and A. Załęska-Fornal	258