

# Contents

## Part I Non-destructive Testing of Transmission Pipelines

<b>Long-Range Ultrasonic and Phased Array Technologies . . . . .</b>	<b>3</b>
Y.N. Mirchev, A.R. Alexiev, A.L. Shekero and S.N. Bukharov	
<b>T- and L-Types of Long-Range Guided Waves for Defect Detection . . .</b>	<b>15</b>
A. Tatarinov, Evgeny N. Barkanov, E. Davydov and M. Mihovski	
<b>Directional Properties of Ultrasonic Antenna Array . . . . .</b>	<b>31</b>
Y.N. Mirchev, A.L. Shekero and V.V. Kozhushko	
<b>Interaction of Low-Frequency Guided Waves with Discontinuities . . . .</b>	<b>45</b>
A.A. Nasedkina, A.R. Alexiev and J. Malachowski	
<b>Vibration-Based Damage Detection of Steel Pipeline Systems . . . . .</b>	<b>63</b>
A.A. Lyapin, Y.Y. Shatilov and A.A. Lyapin, Jr.	
<b>Localization of Impact Damage in Thin-Walled Composite Structure Using Variance-Based Continuous Wavelet Transform . . . . .</b>	<b>73</b>
R. Janeliukstis, S. Rucevskis, M.A. Sumbatyan and A. Chate	
<b>Identification of Defects in Pipelines Through a Combination of FEM and ANN . . . . .</b>	<b>91</b>
A.N. Soloviev, Giang D.T. Nguen, P.V. Vasiliev and A.R. Alexiev	
<b>Dynamic Properties of Thin-Walled Structures Under Changing Pressure Conditions in the Contact Fluid . . . . .</b>	<b>107</b>
M.A. Sumbatyan, Evgeny N. Barkanov and A.E. Tarasov	

## Part II Volumetric Surface Defects in Transmission Pipelines

<b>Characterisation of Volumetric Surface Defects . . . . .</b>	<b>117</b>
Andrei Dumitrescu, Gh. Zecheru and A. Diniță	

<b>Assessment of the Remaining Strength Factor and Residual Life of Damaged Pipelines</b> . . . . .	137
Gh. Zecheru, Andrei Dumitrescu, P. Yukhymets, A. Gopkalo and M. Mihovski	
<b>Assessment of Interacting Volumetric Surface Defects</b> . . . . .	153
M.I. Chebakov, Gh. Zecheru and V.A. Chebanenko	
<b>Part III Materials Used for the Composite Repair Systems of Transmission Pipelines</b>	
<b>Review on Materials for Composite Repair Systems</b> . . . . .	169
V.P. Sergienko, S.N. Bukharov, E. Kudina, C.M. Dusesco and I. Ramadan	
<b>Techniques for Non-destructive Material Properties Characterisation</b> . . . . .	191
Evgeny N. Barkanov, M. Wesolowski, P. Akishin and M. Mihovski	
<b>Characterization of Elastic Properties of Metals and Composites by Laser-Induced Ultrasound</b> . . . . .	209
V.V. Kozhushko, V.P. Sergienko, Y.N. Mirchev and A.R. Alexiev	
<b>Experimental Characterization of Composite Material Properties</b> . . . . .	227
P. Yukhymets, R.I. Dmytriienko, I. Ramadan and S.N. Bukharov	
<b>Part IV Technologies Used for the Composite Repair Systems of Transmission Pipelines</b>	
<b>Comparative Analysis of Existing Technologies for Composite Repair Systems</b> . . . . .	241
E. Kudina, S.N. Bukharov, V.P. Sergienko and Andrei Dumitrescu	
<b>Design of Composite Repair Systems</b> . . . . .	269
Gh. Zecheru, Andrei Dumitrescu, A. Diniță and P. Yukhymets	
<b>Part V Simulation of Advanced Composite Repair Systems of Transmission Pipelines</b>	
<b>Finite Element Stress Analysis of Pipelines with Advanced Composite Repair</b> . . . . .	289
A. Diniță, I. Lambrescu, M.I. Chebakov and Gh. Dumitru	
<b>Finite-Element Modeling of a Repaired Pipeline Containing Two Volumetric Surface Defects</b> . . . . .	311
M.I. Chebakov, R.D. Nedin and A.A. Lyapin	
<b>Assessment of the Reinforcement Capacity of Composite Repair Systems for Pipelines with Interacting Defects</b> . . . . .	321
I. Lambrescu, V.A. Chebanenko, D.V. Gusakov and A.V. Morgunova	

<b>Modeling of the Contact Interaction Between Steel Pipe and Composite Bandage . . . . .</b>	<b>339</b>
I. Lvov and D.A. Beschetnikov	
<b>Experimental and Numerical Research of Renovated Pipeline Prototype with Surface Defect . . . . .</b>	<b>353</b>
Evgeny N. Barkanov, I. Lvov and D.A. Beschetnikov	
<b>Analytical Modeling of the Damaged Zone of Pipelines Repaired with Composite Materials Systems. . . . .</b>	<b>369</b>
A.S. Skaliukh, M.I. Chebakov and Andrei Dumitrescu	
<b>Optimal Design of Composite Repair Systems of Transmission Pipelines. . . . .</b>	<b>387</b>
Evgeny N. Barkanov, I. Lvov and P. Akishin	
 <b>Part VI Testing of Advanced Composite Repair Systems of Transmission Pipelines</b>	
<b>Development of an Experimental Programme for Industrial Approbation . . . . .</b>	<b>401</b>
Gh. Zecheru, Andrei Dumitrescu, P. Yukhymets and R.I. Dmytriienko	
<b>Inner Pressure Testing of Full-Scale Pipe Samples. . . . .</b>	<b>417</b>
R.I. Dmytriienko, S.M. Prokopchuk and O.L. Paliienko	
<b>Effectiveness Assessment of Composite Repair Systems . . . . .</b>	<b>431</b>
R.I. Dmytriienko, O.L. Paliienko, P. Yukhymets, I. Lvov and O. Marusenko	
<b>Errata to: Non-destructive Testing and Repair of Pipelines . . . . .</b>	<b>E1</b>
Evgeny N. Barkanov, Andrei Dumitrescu and Ivan A. Parinov	
<b>Index . . . . .</b>	<b>449</b>

Non-destructive Testing and Repair of Pipelines

Barkanov, E.N.; Dumitrescu, A.; Parinov, I.A. (Eds.)

2018, XVII, 451 p. 280 illus., 100 illus. in color.,

Hardcover

ISBN: 978-3-319-56578-1