

2018 International Ural Conference on Green Energy (UralCon 2018)

**Chelyabinsk, Russia
4-6 October 2018**



**IEEE Catalog Number: CFP18URL-POD
ISBN: 978-1-5386-4937-4**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18URL-POD
ISBN (Print-On-Demand):	978-1-5386-4937-4
ISBN (Online):	978-1-5386-4936-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

CONTENT

<i>Andrey A. Radionov</i> Preface	3
Section 1. Renewable energy systems	
<i>A. Miroshnichenko, E. Solomin, A. Ibrahim</i> Research of Aerodynamic Characteristics of Railway Train for Utilization of Related Airflow Energy	7
<i>A. Ibrahim, E. Solomin, A. Miroshnichenko</i> Control Strategy for Maximum Power Point Tracking of Doubly Fed Induction Motor for Wind Turbine	14
<i>Vladimir Tremyasov, Aleksey Bobrov, Tatiana Krivenko</i> Reliability Theoretical Frequency Assessment of Generation Systems with Photovoltaic Solar Panels.....	20
<i>Galaktion V. Shvedov, Sirojiddin R. Chorshanbiev, Alexey G. Vaskov</i> Analysis and Evaluation of Potential of Renewable Energy Resources of Republic of Tajikistan	26
<i>Dmitry A. Chernov, Nikita D. Karpov, Mikhail G. Tyagunov</i> Features of Design and Operation of Wind-Diesel Complexes	34
<i>Vladimir Tremyasov, Aleksey Bobrov, Tatiana Krivenko</i> Fault Tree Logical-Probabilistic Method of Wind-Diesel Complex Reliability Analysis	39
<i>Andrey G. Batukhtin, Mikhail V. Kobylkin, Sergey G. Batukhtin, Marina G. Baranovskaia</i> Application of Heat Pumps in a Centralized Heat Supply as the Direction of the Development of District Heating Cogeneration.....	45
<i>Evgeny Sirotkin, Andrey Martyanov, Ahmed Ibrahim</i> Mathematical Modeling of Wind Turbine Brake System	51
<i>Alexander V. Bogdan, Vladimir A. Bogdan, Konstantin A. Garkavyi</i> Optimization of Power and Place of Connection of Photovoltaic System for Power Supply of Poultry Farm	57
<i>A.A. Malozemov, V.S. Kukis, A.V. Naumov</i> Hybrid Power System with Variable Speed Diesel Engine	63
<i>Evgeniy Klimov, Elena Bodrova, Evgeny Sirotkin</i> Volume Estimation Methods of Exhausting Bulk Biogas from Russian Growth Range	69
<i>Irina Yu. Ivanova, Tatiana F. Tuguzova, Nadezhda A. Khalsaeva</i> Comparative Analysis of Approaches to Consider Rationale of Use of solar panel plants for Power Supply of Off-Grid Consumers.....	75
<i>S.K. Sheryazov, V.V. Vasenev, Zh.B. Telyubaev</i> Optimization of Reactor Parameters in Anaerobic Digesters	80
<i>I.M. Kirpichnikova, V.V. Shestakova, A.V. Akimov</i> Development of Effective Device for Protection of Solar Modules from Contamination.....	86
<i>S.V. Mitrofanov, D.K. Baykasenov, M.A. Suleev</i> Simulation Model of Autonomous Solar Power Plant with Dual-Axis Solar Tracker.....	90
<i>Andrey Martyanov, Nikita Martyanov, Evgeny Sirotkin</i> State Observer for Variable Speed Wind Turbine	97
<i>O.S. Ptashkina-Girina, N.S. Nizamytdinova, O.A. Guseva</i> Technical-Economic Assessment of Small Hydro-Power Units	101
<i>A.G. Kayumov, Y. P. Gusev, V. V. Govorin</i> Influence of Out-of-Phase of Synchronous Generators on Short-Circuit Currents in Power Systems	107

<i>Artur Sibgatullin, Vladimir Tolmachev</i> Justification of the Parameters of RES Based Energy Complexes for Trunk Gas Pipeline Consumers	114
<i>Alexandr A. Panfilov</i> Features of Calculation Schemes and Methods for Design of Wind Turbine Foundations for Arctic Conditions	122
<i>Viktor Elistratov, Irina Kudryasheva</i> Methodology of Wind-Diesel Power Complexes Parameters Justification for Decentralized Supply of Arctic Regions	127
<i>Oleg Berg, Sergey Prischepov</i> Nonvolatile Portable Power Supply. Performance Capabilities and Organization Principles in Continental Areas	133
Section 2. Renewable energy integration in smart grids and microgrids	
<i>Yuri N. Bulatov, Andrey V. Kryukov, Grigory O. Arsentiev</i> Use of Power Routers and Renewable Energy Resources in Smart Power Supply Systems	143
<i>Pavel V. Ilyushin, Andrew V. Pazderin</i> Approaches to Organization of Emergency Control at Isolated Operation of Energy Areas with Distributed Generation.....	149
<i>V.V. Bukhmirov, A.V. Sadchikov, N.F. Kokarev</i> Increase Methane Emission of Biogas Plant Using Combined Charging Raw Materials.....	156
<i>V.V. Zhukov, R.V. Pugachev, B.O. Nyaware</i> Energy Complexes Consisting of Hydro and Nuclear Power Plants with Low Power Nuclear Reactors	161
<i>V.V. Bukhmirov, A.V. Sadchikov, N.F. Kokarev</i> Determination of the Parameters of the Solar System to Compensate for the Thermal Losses of a Single-chamber Vertical Cylindrical Reactor	167
<i>Ibragim M. Asanov, Egor Y. Loktionov</i> Concepts of Solar Batteries Integration in Linear Infrastructural Objects	173
Section 3. Smart grid energy systems	
<i>Anastasia Chernova</i> Designing Database for Decision Support System for Development of Electrical Grid.....	181
<i>O.V. Gazizova, A.V. Varganova, A.V. Malafeev</i> Steady-State Stability of Industrial Distributed Generation Sources in Terms of Optimization of Their Active and Reactive Power Loading.....	187
<i>Vladislav A. Agapov, Sergei V. Mitrofanov</i> Efficiency of Application of Direct Current Insert for Purpose of Restriction of Short Circuit Currents at Association of Power Supply Systems.....	193
<i>V.Y. Sokolov, S.A. Naumov, E.A. Pivneva</i> Possibility of Receiving Two Types of Energy by Gas-Piston Power Plants on the Basis of Engines of Yaroslavl Motor Plant	198
<i>Philipp Molotov, Alexey Vaskov, Michail Tyagunov</i> Modeling Processes in Microgrids with Renewable Energy Sources.....	203
<i>N.G. Semenova, L.A. Semenova</i> Internal Lighting Control on the Basis of Fuzzy Inference.....	209
Section 4. Energy savings through power electronics devices, electrical machines and drives, etc.	
<i>G.S. Mytsyk, Tin Aung Zaw</i> Features of Practical Implementation of Three Phase Transformer-Rectifier Device with Pulse of Rectified Voltage $P=12$	215

<i>I.M. Kirpihnikova, I.B. Makhsumov, I.S. Nosirov</i> Electric Servo Drive Control System of Milling Machine with Neural Network.....	223
<i>George Palkin, Ivan Suvorov, Roman Gorbunov</i> Evaluation of Ways to Improve the Energy Efficiency of Sites of First Rise Supply Water Systems with Storage Tank by Laboratory Modeling.....	227
<i>D. Yerezhep, V. Kogai, A. F. Minikaev</i> Numerical Analysis of Efficiency Parameters of Thermoelectric Generator for Low-potential Heat Recovery.....	235
<i>I.A. Rostuntsova, S.V. Novichkov, O.V. Zakharov</i> Perspective Directions of Energy Saving Technologies in Distributed Power Generation	242
<i>Sergey Gandzha, Anatoliy Belonozhko</i> Development of Electrical Energy Storage Device Using Direct-Acting Fuel Cells Based on Methanol.....	248
<i>Pavel V. Dikarev, Aleksey A. Yakovlev, Aleksey M. Makarov</i> Development of Technical Solution for Automated Compact Cogeneration Plant Using Search Engineering.....	253
<i>Svetlana N. Trofimova</i> Account of Influence of Electric Arc Parameters at Calculation of Loss of Electricity in Airlines of Electric Transmissions	259
<i>Aleksey Makarov, Mikhail Kukhtik</i> Automated System of Frequency Control for Drive of Cascade Pump Station of Random Configuration	265
<i>S.V. Os'kin, V.A. Didych</i> Control Axial Pump Aggregate at Static Pressure Change	270
<i>Tao Jing, Alexander S. Maklakov</i> A Review of Voltage Source Converters for Energy Applications	275
<i>Sergey Gandzha, Aminov Dilshod, Kosimov Bakhtiyor</i> Design of Brushless Electric Machine with Axial Magnetic Flux Based on the Use of Nomograms	282