

2021 6th International Symposium on Environment-Friendly Energies and Applications (EFEA 2021)

**Sofia, Bulgaria
24-26 March 2021**



**IEEE Catalog Number: CFP2176T-POD
ISBN: 978-1-7281-7012-1**

**Copyright © 2021 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:	CFP2176T-POD
ISBN (Print-On-Demand):	978-1-7281-7012-1
ISBN (Online):	978-1-7281-7011-4
ISSN:	2641-5925

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

TABLE OF CONTENTS

REASSESSMENT OF THE IMPORTANCE OF THE PASSIVE EQUIPMENT AVAILABILITY IN THE NPP ACCIDENT PROGRESSION	1
<i>Groudev Pavlin, Kichev Emil, Petrova Petya</i>	
MOHRES, A SOFTWARE TOOL FOR ANALYSIS AND MULTIOBJECTIVE OPTIMISATION OF HYBRID RENEWABLE ENERGY SYSTEMS-AN OVERVIEW OF CAPABILITIES	9
<i>Alireza Maheri</i>	
EXPERIMENTAL STUDY OF THE AIR EXCHANGE IN LIVESTOCK BUILDING	15
<i>Ivan Denev, Ivan Ivanov, Koycho Atanasov</i>	
MULTIPLYING THE EFFECT OF NITROGEN OXIDES REDUCTION UNDER VORTEX BURNER CONDITIONS AT GAS FUEL INJECTION	20
<i>Neven Krystev</i>	
EMBEDDING SENSORS BY E-EMBROIDERY: PRACTICAL STEPS FOR SMART TEXTILES PRODUCTION.....	24
<i>Daniela Sofronova, Radostina A. Angelova</i>	
FACILE SYNTHESIS OF BISMUTH-BASED PEROVSKITE AND SOLVENT ENGINEERING FOR IMPROVING THE CRYSTALLINITY OF LEAD-FREE PEROVSKITE MATERIAL: A MICROSTRUCTURAL EXPLORATION	29
<i>Ayesha Hashmi, Bhawana Jain, Jai Singh, Mariya Aleksandrova, Ajaya Kumar Singh</i>	
THERMAL MANIKINS – GENERAL FEATURES AND APPLICATIONS	34
<i>Iskra Simova, Radostina A. Angelova, Detelin Markov, Rositsa Velichkova, Peter Stankov</i>	
CONDITIONAL FEEDBACK CONTROL OF SECOND-ORDER PROCESS.....	39
<i>Vessela Karlova-Sergieva</i>	
ENERGY EFFICIENT TEMPERATURE CONTROL	44
<i>Desislava Stoitseva-Delicheva</i>	
COACH ING: FROM MODEL TO TOOL.....	48
<i>Viviana Callea, Roberta Tempone, Antonio D’Andrea, Lia Matrisciano, Mihai Ursache, Giulia D’Angelo, Germana Remici</i>	
CHAR FORMED DURING BIOMASS COMBUSTION AND GASIFICATION.....	52
<i>Tsvetelina Petrova, Iliyana Naydenova, Ricardo Ferreira, Stela Atanasova-Vladimirova, Bogdan Rangelov</i>	
AN ALGORITHM FOR LOAD PLANNING OF RENEWABLE POWERED MACHINERY WITH VARIABLE OPERATION TIME	57
<i>Abdihakim Bokah, Alireza Maheri</i>	
FLOW CHARACTERISTICS AT THE OUTLETS OF AIR TERMINAL DEVICES.....	62
<i>Detelin Markov, Peter Stankov, Iskra Simova, Rositsa Velichkova, Radostina A. Angelova, George Pichurov</i>	
ESTIMATION OF THE HIGHER HEATING VALUES FOR LIGNOCELLULOSIC BIOFUELS	67
<i>Tsvetelina Petrova</i>	

NUMERICAL RESEARCH OF THE PHASE CHANGE IN FIXED HONEYCOMB REGENERATOR FOR HUMID AIR.....	72
<i>Angel Penev, Lyubomir Tsokov</i>	
DESIGN OF A DEVICE FOR MEASURING THE PARAMETERS OF THE MICROENVIRONMENT UNDER PROTECTIVE FACE MASKS	78
<i>Daniela Sofronova, Yavor Sofronov, Radostina A. Angelova</i>	
THE EFFECT OF BUOYANCY FORCES IN BUILDINGS ON THE EFFICIENCY OF UNBALANCED REGENERATIVE AIR HANDLING UNITS	82
<i>Angel Penev, Lyubomir Tsokov</i>	
OPTIMAL DAY-AHEAD OPERATION FOR A PV-BASED BATTERY SWAPPING STATION FOR ELECTRIC VEHICLES	87
<i>Ahmed A. Shalaby, M. F. Shaaban, Mohamed Mokhtar, H. H. Zeineldin, E. F. El-Saadany</i>	
A DECISION SUPPORT SYSTEM FOR DECOMMISSIONING OF OFFSHORE WINDFARMS: THE DATA PLATFORM.....	95
<i>Alireza Maheri, Shahin Jalili</i>	
SENSITIVITY STUDY OF OXIDATION MODELS IN QUENCH-12 EXPERIMENT SIMULATIONS WITH RELAP/SCDAPSIM MOD3.5+IUA.....	101
<i>Ivan G. Spasov, Kalin B. Filipov</i>	
OPTIMAL OPERATION OF POWER SYSTEM INTEGRATED WITH REVERSE OSMOSIS WATER DESALINATION	106
<i>Zahra H. Alnahhal, M. F. Shaaban, M. Hamouda, Mohamed Mokhtar</i>	
MULTIOBJECTIVE OPTIMISATION OF JOB SHOP SCHEDULING OF RENEWABLE POWERED MACHINERY	111
<i>Abdihakim Bokah, Alireza Maheri</i>	
STUDIES ON THE ACTIVATED CARBON REPLACEMENT BY ZEOLITE NA-X IN THE GAS PURIFICATION SYSTEM OF 1000 MWE NUCLEAR POWER PLANT TO IMPROVE NUCLEAR SAFETY	117
<i>Denitza Zgureva, Victoria Tomova, Silviya Boycheva</i>	
AIR DISTRIBUTION IN A CLASSROOM AT VARIOUS SUPPLY DIFFUSER OPERATION MODES	122
<i>Marina Zasimova, Nikolay Ivanov, Evgueni Smirnov, Detelin Markov, Peter Stankov</i>	
CONTROL OF HEAT REMOVAL FROM MULTI-ROW PLAIN TUBE BANKS TYPICAL FOR SUBSEA COOLERS.....	128
<i>Nikolay Ivanov, Anna Podmarkova, Vladimir Ris, Nikolai Tschur, Marina Zasimova</i>	
STUDY OF THE POSSIBILITIES FOR USING METHANE AS A TRANSPORT FUEL THROUGH BIOMASS GASIFICATION PROCESS.....	134
<i>Penka Zlateva, Angel Terziev</i>	
MODELLING OF OCCURANCE AND DEVELOPMENT OF FIRE IN CONFINED SPACES	138
<i>Ivan Antonov, Rositsa Velichkova</i>	
INVESTIGATION OF OPERATION OF HEAT SENSOR LOCATED ON THE CEILING	142
<i>Svetlin Antonov, Kamen Grozdanov</i>	

DATA-DRIVEN PARAMETER FAULT CLASSIFICATION FOR A DC–DC BUCK CONVERTER.....	146
<i>Yichuan Fu, Zhiwei Gao, Aihua Zhang</i>	
DETERMINING THE OPTIMAL PARAMETERS OF VERTICAL AXIS WIND TURBINE WITH AN INNER CYLINDER.....	153
<i>Valentin Obretenov, Rossen Iliev, Tsvetan Tsalov</i>	
DISPATCH STRATEGY AS A DESIGN VARIABLE IN HYBRID RENEWABLE ENERGY SYSTEM OPTIMISATION.....	158
<i>Mohammed Althani, Alireza Maheri</i>	
DETERMINATION OF THE OPTIMAL PARAMETERS OF A VERTICAL AXIS WIND TURBINE WITH CYLINDRICAL GUIDE VANE UNIT.....	163
<i>Valentin Obretenov, Rossen Iliev</i>	
MATHEMATICAL MODELING OF STEAMGENERATOR PGV-1000, USED IN NUCLEAR POWER PLANT WITH WWER-1000 NUCLEAR REACTOR.....	168
<i>Vladimir M. Monev, Kalin B. Filipov</i>	
COMPARATIVE STUDY OF LSC AND X-RAY MEASUREMENTS OF NB-93M.....	174
<i>Mladen Mitev, Lyuben Dobrev, Dobromir Dimitrov</i>	
CONCEPT AND PHYSICAL PROTOTYPING OF MICRO HYDROPOWER SYSTEM USING VERTICAL CROSSFLOW TURBINE.....	179
<i>Georgi Todorov, Valentin Obretenov, Konstantin Kamberov, Tsvetozar Ivanov, Tsvetan Tsalov, Blagovest Zlatev</i>	
INDUCTION MACHINE DRIVEN PUMP APPLIED AS TURBINE IN MICRO-HYDRO POWER PLANTS.....	183
<i>Mateja Nikolic, Dejan Mršević, Lepasava Ristic, Đorđe Cantrak, Novica Jankovic</i>	
CONCEPT AND VIRTUAL PROTOTYPING OF COOLING MODULE FOR PHOTOVOLTAIC SYSTEM.....	189
<i>Georgi Todorov, Hristo Vasilev, Konstantin Kamberov, Tsvetozar Ivanov, Yavor Sofronov</i>	
PRIMARY GASEOUS EMISSIONS DURING BIOMASS COMBUSTION.....	193
<i>Ognyan Sandov, Iliyana Naydenova, Rositsa Velichkova</i>	
DRAUGHT RATE ASSESSMENT IN A VENTILATED CLASSROOM BASED ON EIGHT HOURS LONG MONITORING OF INDOOR THERMAL ENVIRONMENT PARAMETERS.....	199
<i>Detelin Markov, Peter Stankov, Iskra Simova, Rositsa Velichkova, Radostina A. Angelova, Nikolay Ivanov</i>	
DRAUGHT RATE ASSESSMENT IN A VENTILATED CLASSROOM, BASED ON ONE HOUR-LONG RECORDS OF AIR VELOCITY AND AIR TEMPERATURE.....	204
<i>Detelin Markov, Peter Stankov, Iskra Simova, Rositsa Velichkova, Radostina A. Angelova, Nikolay Ivanov</i>	
OPPORTUNITY OF HYDROGEN PRODUCTION IN RENEWABLE POWER PLANTS: CASE OF ISLAND OF MAURITIUS.....	209
<i>Dhirajsing Rughoo, Alireza Maheri, Radhakrishna Somanah, Mohammed Althani</i>	
INDOOR AIR QUALITY ASSESSMENT USING LOW-COST COMMERCIAL OFF-THE-SHELF SENSORS.....	214
<i>Marin B. Marinov, Borislav T. Ganev, Dimitar N. Nikolov</i>	

DESIGN AND ENERGY EFFICIENCY OF THE FAMILY PASSIVE HOUSE – CASE STUDY	218
<i>Jovana Šipovac, Đorđe Cantrak</i>	
OPTIMISATION OF WASTE HEAT RECOVERY SYSTEM IN PAPER MACHINE DRYER SECTION	223
<i>Nikola Tanasic, Miloš Ivošević, Tomislav Simonovic</i>	
ANALYTICAL MODELLING OF HYDRAULIC PROPORTIONAL SPOOL VALVE PILOT OPERATED WITH SWITCHING MICRO VALVES	229
<i>Alexander Mitov, Jordan Kralev, Tsonyo Slavov, Ilcho Angelov</i>	
RISK ASSESSMENT AND MANAGEMENT DURING THE IMPLEMENTATION PROCESS OF A SMALL SCALE HYDROPOWER PLANTS	233
<i>Angel Terziev, Hriso Beloev, Iliya Iliev</i>	
EFFICIENT USE OF WASTE HEAT IN THE COGENERATIVE PLANT FROM BIOMASS GASIFICATION	239
<i>Mirjana Stamenic, Branislav Gajic</i>	
MODELLING TRANSPORT EMISSION OF AN OUT OF TOWN CENTRE TO ACHIEVE EMISSION REDUCTION TARGETS	244
<i>Faheem Ahmed Malik, Margaret Bell, Laurent Dala, Krishna Busawon</i>	
ENERGY EFFICIENCY IN SOCIAL HOUSING SECTOR IN SERBIA: PROBLEMS AND BENEFITS	251
<i>Vesna-Mila Colic-Damjanovic, Grozdana Šišovic</i>	
ANALYSIS OF HYDROLOGICAL HAZARDS BASED ON THE RELIEF OF BULGARIA	255
<i>Rositsa Velichkova, Iskra Simova, Radostina A. Angelova, Milka Uzunova</i>	
ASSESSMENT OF FOREST FIRE RISK IN SOUTH-WESTERN REGION OF BULGARIA	260
<i>Rositsa Velichkova, Radostina Angelova, Iskra Simova</i>	
INTEGRATED SYSTEM FOR WAVE ENERGY HARVESTING	264
<i>Rositsa Velichkova, Peter Stankov, Iskra Simova, Detelin Markov, Radostina A. Angelova, Martin Pushkarov, Ivan Denev</i>	
AN ANT COLONY ALGORITHM FOR HRES SIZE AND CONFIGURATION OPTIMISATION.....	268
<i>Mohammed Althani, Alireza Maheri</i>	

Author Index