

IET International Conference on Resilience of Transmission and Distribution Networks (RTDN 2015)

IET Conference Publications 668

Birmingham, United Kingdom
22 – 24 September 2015

ISBN: 978-1-5108-2181-1

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by the Institution of Engineering and Technology
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the Institution of Engineering and Technology
at the address below.

Institution of Engineering and Technology
P. O. Box 96
Stevenage, Hertfordshire
U.K. SG1 2SD

Phone: 01-441-438-767-328-328
Fax: 01-441-438-767-328-375

www.theiet.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SYSTEM RESTORATION USING THE “BLACK START” CAPABILITY OF THE 500MW EIRGRID EAST-WEST VSC-HVDC INTERCONNECTOR	1
<i>N. Macleod, N. Cowton, J. Egan</i>	
REFERENCE ARCHITECTURE FOR SELF HEALING DISTRIBUTION NETWORKS	6
<i>T. Berry, Y. Chollot</i>	
ENHANCEMENT OF POWER SYSTEM PERFORMANCE USING OFFLINE STUDIES FOR INDUSTRIAL & UTILITY SYSTEMS	11
<i>R. A. Budha, F. Hashiesh</i>	
RESOURCE CONSTRAINED DISTRIBUTION NETWORK MODELLING UNDER SEVERE WEATHER CONDITIONS	17
<i>D. J. Clements, P. Mancarella</i>	
MANAGING RISKS FROM REVERSE FLOWS UNDER DISTRIBUTION NETWORK OUTAGE SCENARIOS	23
<i>J. L. Calvo, S. H. Tindemans, G. Strbac</i>	
RISK ASSESSMENT OF DYNAMIC THERMAL RATING SYSTEM	29
<i>Jiashen Teh, I. Cotton</i>	
COMPARISON OF APPROACHES FOR QUANTIFYING DEMAND SIDE RESPONSE CAPACITY CREDIT FOR THE USE IN DISTRIBUTION NETWORK PLANNING	35
<i>P. Djapic, S. Tindemans, G. Strbac</i>	
IMPACT OF CLIMATE CHANGE ON THE RESILIENCE OF THE UK POWER SYSTEM	41
<i>M. Panteli, P. Mancarella, X. Hu, I. Cotton, D. Calverley, R. Wood, C. Pickering, S. Wilkinson, R. Dawson, K. Anderson</i>	
INTEGRATING HIGH IMPACT LOW PROBABILITY EVENTS IN SMART DISTRIBUTION NETWORK SECURITY STANDARDS THROUGH CVAR OPTIMISATION	47
<i>R. Moreno, G. Strbac</i>	
RECONFIGURING ELECTRICAL NETWORKS FOR ENHANCED RESILIENCE	53
<i>J. O’Riordan</i>	
TWO-STAGE STOCHASTIC DUAL DYNAMIC PROGRAMMING FOR TRANSMISSION EXPANSION PLANNING WITH SIGNIFICANT RENEWABLE GENERATION	59
<i>Z. Wu, P. L. Zeng, X. P. Zhang, Hao Fu, Qian Dai</i>	
A FAST AND AUTOMATIC CANDIDATE LINES SELECTION APPROACH FOR TRANSMISSION EXPANSION PLANNING	65
<i>Z. Wu, P. L. Zeng, X. P. Zhang, Hao Fu, Qinyong Zhou</i>	
SHUNT COMPENSATION DESIGN OF EHV DOUBLE-CIRCUIT MIXED OHL-CABLE CONNECTIONS	71
<i>H. Khalilnezhad, S. Chen, M. Popov, J. A. Bos, J. P. W. De Jong, L. Van Der Sluis</i>	
IMPROVEMENT OF STABILITY ANALYSIS AND ASSESSMENT THROUGH WAVELET DECOMPOSITION	77
<i>A. Z. M. Shahriar Muttalib, G. A. Taylor, M. E. Bradley</i>	
ASSESSMENT OF GB TRANSMISSION SYSTEM 400 KV SOUTH-EAST LOOP REACTIVE COMPENSATION REQUIREMENTS	83
<i>J. Peng, D. Kho, J. M. Moniet, K. S. Smith, B. Marshall, J. Toal</i>	
APPLICATION OF AUTOMATIC LOAD TRANSFER ON FEEDER UTILISATION BALANCE	89
<i>X. Bai, D. Strickland, C. Harrap</i>	
IEC61850 FOR DISTRIBUTION FEEDER AUTOMATION	95
<i>T. Berry, L. Guise</i>	
TRANSMISSION CONSTRAINT MANAGEMENT SYSTEM (TCMS)	100
<i>P. Richardson, A. Hewitt</i>	
ADAPTIVE UNDER FREQUENCY LOAD SHEDDING SCHEME BASED ON DYNAMIC SECURITY ASSESSMENT	105
<i>N. Shams, P. Wall, V. Terzija</i>	
RISK ASSESSMENT OF AN IEC 61850 BASED SUBSTATION COMMUNICATION NETWORK IN A SYSTEM INTEGRITY PROTECTION SCHEME	111
<i>Nan Liu, M. Panteli, P. A. Crossley</i>	
DEVELOPMENT AND TESTING OF AN EXPERIMENTAL POWER SYSTEM FAULT DEMONSTRATOR	117
<i>C. Rose, B. W. P. Thomas, M. Sumner, E. Christopher</i>	

IMPACT OF PHOTOVOLTAIC (PV) INSTALLATIONS ON THE PROTECTION SYSTEM OF A LOCAL DISTRIBUTION NETWORK.....	123
<i>D. M. Dalabeih, A. M. Abdelhalim, A. R. Bishawi, A. A. Ibrahim, T. I. Abu Halima</i>	
EARLY AGEING OF 33KV TRANSFORMERS IN A DISTRIBUTION NETWORK	127
<i>D. M. Wang, B. Patel, Z. D. Wang, B. Wells</i>	
OPTASENSE[®] DISTRIBUTED ACOUSTIC SENSING (DAS) SYSTEM FOR THE POWER NETWORK - INTEGRATED SMART-SENSING REAL TIME MONITORING	132
<i>K. Singh, C. Minto, A. Godfrey</i>	
SIMULATED AND MEASURED INTER-AREA MODE SHAPES AND FREQUENCIES IN THE ELECTRICAL POWER SYSTEM OF GREAT BRITAIN	136
<i>J. Turunen, H. Renner, W. W. Hung, A. M. Carter, P. M. Ashton, L. C. Haarla</i>	
WEATHER FORECASTING TO PREDICT PRACTICAL DYNAMIC ASSET RATING OF OVERHEAD LINES	142
<i>L. M. Chittock, D. Strickland, C. Harrap</i>	
EVALUATION OF BENEFITS OF COORDINATED DC & AC FLEXIBLE TRANSMISSION SYSTEMS WITH PROBABILISTIC SECURITY AND CORRECTIVE CONTROL	148
<i>R. Moreno, Yanfei Chen, G. Strbac</i>	
PREDICTING PRACTICAL BENEFITS OF DYNAMIC ASSET RATINGS OF 33KV DISTRIBUTION TRANSFORMERS.....	154
<i>J. Yang, L. Chittock, D. Strickland, C. Harrap</i>	
DESIGN OF EXPERIMENTAL SETUP TO STUDY FACTORS AFFECTING HOT SPOT TEMPERATURE IN DISC TYPE WINDING TRANSFORMERS	160
<i>M. Daghra, Z. D. Wang, Q. Liu, D. Walker, P. W. R. Smith, P. Mavrommatis</i>	
EXPERIENCE OF AVAILABILITY OF SODIUM-NICKEL BASED ENERGY STORAGE	166
<i>M. A. Varnosfaderani, D. Strickland, C. Harrap</i>	
FAN-PAD EVAPORATIVE BATTERY COOLING FOR HYBRID ELECTRIC VEHICLE THERMAL MANAGEMENT.....	172
<i>A. D. El-Ladan, O. C. L. Haas</i>	
AN IMPROVED PSO ALGORITHM BASED ON STATISTICS FOR DISTRIBUTION NETWORK RECONFIGURATION TO INCREASE THE PENETRATION OF DISTRIBUTED GENERATIONS.....	179
<i>J. Zhu, Z. Wu, P. Jiang, S. Song, J. Ren, W. Sheng, K. Liu, W. Gu</i>	
Author Index	