

Vol. 16, No. 1 • January 2014
Half-yearly Journal

ISSN : 2229-4465 (Print)
ISSN : 0976-2396 (Online)

POWER ENGINEER *Journal*



SOCIETY OF POWER ENGINEERS (INDIA)
under the aegis of
CENTRAL BOARD OF IRRIGATION & POWER
Malcha Marg, Chanakyapuri, New Delhi - 110 021
Ph. : 91-11-2611 5984/2611 6567, Fax : 91-11-2611 6347
E-mail : cbip@cbip.org; Web: <http://www.cbip.org>



Half yearly

SUBSCRIBED



POWER ENGINEER JOURNAL

Volume 16, No. 1, January 2014

CONTENTS

	Page No
Editorial Advisory Board	
• T.N. Thakur , Former CMD, PTC & President, SPE India	
• Ashok Thapar , Member (Power), BBMB	
• Ramesh Narayanan , CEO BSES Yamuna Power Limited	
• T.P. Govindan , Director, Electrical Research & Development Association	
• Prof. S.V. Kulkarni , IIT, Mumbai	
• G.V. Akre , President, SPE - Vadodara Chapter	
• Jivendra Jha , Former MD, Nepal Eley Authority	
Editor	
• V.K. Kanjlia , Secretary, SPE & CBIP	
Associate Editors	
• P.P. Wahi , Director, CBIP	
• Vishan Dutt , Sr. Manager, CBIP	
Executive Committee	2
Editor's Note	3
Articles	
• Real-Time Substation Monitoring using Wireless Sensor Module – <i>B.K. Karmakar and A.K. Sinha</i>	4
• Demand Response in the Indian Context – <i>Dr. Puneet Chitkara, Bridgit Hartland Johnson, Anish De, Vikas Gaba, V. Bharath, Dr. Vasudha Lathey, Sanjay Dube and Anand Vadakkath</i>	9
• Grid Synchronization System for Solar PV System under Ideal and Non-Ideal Grid Conditions – <i>S.A. Lakshmanan, B.S. Rajpourhita and Amit Jain</i>	15
• RE Generation in Gujarat : Techno-Commercial Impact – <i>B.B. Mehta and D.H. Patel</i>	22
• Advanced AMI & MDM Solutions for Meeting Smart Grid Needs – <i>A. Rajesh and Sandeep Pathak</i>	27
• 3D Experiencity: Innovative Solutions for a Sustainable Future – <i>Abhinav Chowdhary, Jignesh Pattani and Bhushan Sawant</i>	31
• Potential Savings by Adopting Energy Efficiency and Challenges in Implementation – <i>Seema Gupta and S. Victor P. Selvakumar</i>	34
Activities of the Vadodara Chapter of SPE	37
Technical Data	42
News	44

Subscription Information 2014/ (2 issues)

Institutional subscription (Print & Online)	: Rs. 900/US\$75
Institutional subscription (Online only)	: Rs. 600/US\$50
Institutional subscription (Print only)	: Rs. 600/US\$50
Life Membership for 10 Years (Print)	: Rs. 5,000
Life Membership for 10 Years (Print & Online)	: Rs. 8,000



POWER ENGINEER JOURNAL

Volume 16, No. 2, July 2014

CONTENTS

Page No

Editorial Advisory Board

- **T.N. Thakur**, Former CMD, PTC & President, SPE India
- **Ashok Thapar**, Member (Power), BBMB
- **Ramesh Narayanan**, CEO BSES Yamuna Power Limited
- **T.P. Govindan**, Former Director, Electrical Research & Development Association
- **Prof. S.V. Kulkarni**, IIT, Mumbai
- **G.V. Akre**, President, SPE - Vadodara Chapter
- **Jivendra Jha**, Former MD, Nepal Elec Authority

Editor

- **V.K. Kanjlia**, Secretary, SPE & CBIP

Associate Editors

- **P.P. Wahi**, Director, CBIP
- **Vishan Dutt**, Sr. Manager, CBIP

Executive Committee

2

Editor's Note

3

Articles

- Reliability of UHV Transformers – On behalf of CIGRE SC A2 - AG A2.5 (UHV AC & DC Transformers) – *Y. Shirasaka, T. Kobayashi, G. Li and L. Guan, Z. Zhao and S.K. Agrawal* 4
- Phase Shifting Transformers can Optimize the Transmission Infrastructure, Reduces the Losses, Improves Grid Stability, Reduces Congestion, Changes the Active & Reactive Power Flow both in Magnitude and Direction – *Shagufta Khan and M.I. Khan* 18
- Power System Protection & Power Swings – *P.P. Francis* 33
- Experiences and Benefits with Substation Automation and Protection Schemes Based on IEC 61850 – *N.M. Sheth, S.K. Jadav and B.J. Patel* 42
- Challenges in Adoption of International Model of Consumer Protection in India for Mass Roll Out of Smart Energy Meters – *Prof. C. Balasubramanya* 50
- Improvements in Internal Insulation Design of Power Transformer using Electric Field Analysis through Finite Element Method – *G. Sreelatha, M. Rajkumar, Y. Sudhakar and T.K. Ganguly* 56
- Evacuation of Power from Group of Wind Turbine Generators - Various Perspectives – *S.M. Takalkar* 61

Activities of the Vadodara Chapter of SPE

73

Technical Data

76

News

78

Subscription Information 2014/ (2 issues)

Institutional subscription (Print & Online) : Rs. 900/US\$75
 Institutional subscription (Online only) : Rs. 600/US\$50
 Institutional subscription (Print only) : Rs. 600/US\$50

Life Subscription for 10 Years (Print) : Rs. 5,000
 Life Subscription for 10 Years (Print & Online) : Rs. 8,000