## CONTENTS

			PAGE
I.	TRA	NSMISSION-GENERAL	1
	1.	The Art and Science of Flexible A.C Transmission System—O.P. Jain, T.S. Bhatia, S.K. Gupta and R.R. Garg	4
	2.	HVDC Transmission - Historical Prospective and Indian Scenario—C.V.J. Varma and P.K. Lal	12
	3.	Chandrapur—Padghe HVDC Project of MSEB—R.V. Nadkarny, V.D. Ambekar and S.D. Shrouty	20
	4.	Transmission System in the United Kingdom-A Report-V. Parameswara Rao	25
	5.	Power Transmission Lines Way Leave a Socio Economic Concept—A.M. Dumbhare	32
П.	TRA	ANSMISSION-PLANNING	39
	6.	Planning of Asynchronous Inter-regional Links and their Importance in Indian Power Environment—R.K Narayan and P.K. Dwivedi	42
	7.	AC Interconnection between Eastern and Western Region of India — A Major Step Towards National Power Grid—R.K. Narayan and P.K. Dwivedi	50
	8.	Techno-economic Feasibility of V-suspension Insulator Strings for 400 kV Transmission Lines—O.P. Gupta, V.B. Singh, R.K. Sharma and Samnoon Ahmad	56
	9.	Techno-economic Evaluation of 800 kV Class Conductor Bundle—O.P. Gupta, V.B. Singh and Satish Kumar	63
1	10.	Techno-economic Assessment of 220 kV Six Phase Transmission System—Dr. M. Ramamoorty, R. Susendran, R. Ramesh Babu, N.V. Ramesh and D. Revanna	72
	11.	Techno-commercial Evaluation of Quantities and Strategies for Tender Documentation— B.D. Bhagtani	77
ш	. TR	ANSMISSION-DESIGN	81
	12.	New Trends in Transmission Line Tower Design with Reference to Revision in IS-802— K.V.S.S. Prasad, E.V. Rao, M. Krishna Kumar and D. Choudhury	86
	13.	Implication of Revised Code IS: 802 (Part I/Sec I) on Tower Designs - Case Study—Dr. P. Bose and G.K. Ghosh	103
	14.	Optimum Design of a Transmission Line Tower Using Sequential Linear Programming— K. Jayasimha and Dr. S.S. Bhavikatti	109
	15.	Optimum Technical Parameters for Transmission Tower in Hilly Area—A.K Chanana and A.L. Jaggi	113
	16.	EHV Lines Design Development for Himalayan Region in U.P.—K.B. Mathur, V.B. Singh, Surendra Narayan, R.P Singh and V.K. Srivastava	117
	17.	Optimization of Tower Design by Providing Insulated Cross- arms—B.A. Chaudhari and R.K. Misra	123
	18.	Multi-circuit E.H.V. Line for Evacuation-J.A. Patel, S.N. Sovani and S.M. Takalkar	128
	19.	Tower Top Geometry—Air Clearances and Swing Angles—M.L. Sachdeva	134
	20.	Electrical Clearances for Overhead Transmission Lines—K.B. Mathur, A.K. Vashishtha, V.B. Singh, Surendra Nurain and V.K. Srivastava	151

		PAGE
21.	800 kV Anpara - Unnao Transmission Line Shieldwire Ampacity—B.S. Mathur, V.B. Singh and Samnoon Ahmad	158
22.	Selection of Tower Footing in a Composite Soil—S.M. Takalkar	163
23.	Soil Density Measurements for Effective Tower Foundation Designs—S.A. Shah, S.M. Takalkar, K.H. Patel and M.T. Shah	169
IV. TR	ANSMISSION-ENGINEERING	173
24.	Production Planning for Minimising Wastages in Tower Manufacture—Monal Patel, M.C. Mehta and D.S. Gandhi	177
25.	Tower Fabrication Planning with respect to Minimising Wastages-B.N. Pai	179
26.	Quality Assurance in manufacture of Towers and bought out times—M.C. Satle	182
27.	Proto Type Testing of Transmission Line Towers—P.R. Natarajan	192
28.	Techno-Commercial Aspect of Tower Testing-Pranav Doshi and B.B. Shah	194
29.	Foundation-Practices for Long-span Special Towers-S.D. Dand and G.D. Rathod	199
30.	400 kV Single Circuit Line Lilo on Double Circuit Tower—O.P. Gupta, V.B. Singh, V.K. Srivastava and R.K. Sharma	207
31.	Pull-out Tests on Foundations—S.M. Takalkar	211
32.	Important Clues for Classification of Tower Foundation with Reference to Soil Structure— D.C. Bagde	216
33.	Fibre Optic Guardwire—Installation—R.K. Mishra and A.R. Bhople	223
V. TR	ANSMISSION—OPERATION & MAINTENANCE	231
34.	Operation and Maintenance of Transmission Line Support Body and Foundations—C.N. Panchal and S.M. Takalkar	233
35.	Strengthening the Tower Foundations without Shut-down-R. Susendran and R. Ramesh Babu	237
36.	Hot Line Maintenance of E.H.T. Transmission Lines and Sub- stations in M.P.E.B.— V.P. Chawla, S.Z. Hussain, Ashok Bajpai	243
37.	Corrosion of Transmission Line Tower Stubs—O.P. Gupta, V.B. Singh, Surendra Narain and Samnoon Ahmad	252
38.	Improving Fatigue Strength of Insulator String of EHV Transmission Lines-Dr. T.V. Gopalan	257
39.	Lightning Performance of Transmission Lines—Anil Chanana	264
VI. TR	ANSMISSION COMPACTION/UPRATING	275
40.	Compaction of Transmission Lines—An Overview—M.L. Sachdeva	279
41.	Compaction Possibilities in 132 kV Transmission on Poles—S.K. Agarwal, V.B. Singh, S.P. Nigam, S.K. Chawla and D.N. Pant	292
42.	Upgradation of Transmission Lines Design Considerations, Constraints & Feasible Solutions— P.K. Dwivedi, M. Krishna Kumar, D. Chowdhury and Anish Anand	300
43.	Design and Construction Criteria for Uprating of HVAC Transmission Lines—Dr. S.N. Mandal, M.V. Srinath, K. Mohandas and S. Das Gupta	312

		PAGE
44.	Upgradation of Transmission Lines—Review of Different Apparatus—K. Kasturi	317
45.	Mechanical Aspects of Insulators for Overhead Line Compaction—Dr. D. Dumora and J.C. Keuller	323
46.	Uprating of a Transmission Line by Utilising the Existing Towers - A Case Study-R. Susendran, Dr. K.R.C. Nair, R. Ramesh Babu, N.V. Ramesh and D. Revenna	331
47.	Upgradation of 66 kV Double Circuit Line to 132 kV Double Circuit Line—Experience of APSEB— K.Y. Venugopala Rao	337
48.	Uprating and Upgrading of Transmission Lines in Tata Electric Companies—N.K. Gupta, R.K. Mishra and A.R. Bhople	342
VII. TI	RANSMISSION-RESEARCH & DEVELOPMENT	349
49.	All Aluminium Alloy Conductor - A Boon to Transmission and Distribution System— S.R. Krishnamurthy and P. Selvan	352
50.	Simulation Studies on TNA for 800 kV UHV Transmission—S. Parameswaran, G.S. Lakshminarayana, Sujatha Subhash, M. Kanyakumari and K.S. Meera	360
51.	Special Purpose Tapping Tower for E.H.V. Lines-J.A. Patel and S.M. Takalkar	366
52.	Maintenance of Transmission Lines-R.A. Jani	372
53.	Tower Foundation Inspection & Rectification—S.M. Takalkar	376
54.	Tower Failure Analysis—S.M. Takalkar	379
55.	Estimation of weight and base width for Horizontal Configuration Towers—R. Susendran, P. Krishnamurthy, Afsar Ahmed, T. Raghunatha and D. Revanna	387
56.	Magnetic Field Effects of 800 kV Transmission Lines-Dr.V.N. Rikh, V.P. Singh, Samnoon Ahmad	390
57.	Diagnosing the Lightning Trip-outs of Transmission Lines—A Case Study—J.S. Sandha, S.K. Gupta, S.K. Paul and K.K. Guru	396
58.	Computation and Measurement of Electric Field Strength in AC Transmission Systems— K. Ravi Kumar, R. Maruti, K.M. Srinivasa,, Channakeshava and M.C. Ratra	403
59.	Field Studies made by MPEB on the Problems of Aeolian Vibration & Comparative Study of Various Vibration Damping Systems Using Different Kinds of Vibration Recorders—  P.K. Dubey, M.N. Sarvate, Ashok Bajpai and P. Pathak	409
60.	Estimation of Lightning Performance and Back Flashover Rate of Transmission Lines— M. Kanya Kumari, R.S.S. Aradhya and Channakeshava	423
61.	Experimental Evaluation of Spacer/spacer Damper for Twin Bundle Conductors—R. Susendran, K.B. Manjunath and N.S. Parthasarathy	431