

CONTENTS

	Page No.
Abstract	
Chapter : 1 Introduction	1-2
Chapter : 2 Literature Review	2-5
Chapter : 3 Active and Reactive Power Flow	6-9
3.1 Active and Reactive Power Flow	6
3.2 Analysis of Power Flow using MATLAB program	8
3.3 Power Flow Analysis of two bus network	8
3.4 Conclusion	9
Chapter : 4 Analysis of Power Flow	10-14
4.1 Principle of Power Transmission	10
4.2 Controllable Parameter	14
4.3 Conclusion	14
Chapter : 5 Series Compensation	15-18
5.1 Principle of Series Compensation	15
5.2 Capacitive Compensation	17
5.3 Types of Series Compensator	18
5.4 Conclusion	18
Chapter : 6 Thyristor Controlled Series Capacitor (TCSC)	19-26
6.1 Introduction	19
6.2 Thyristor Controlled Reactor (TCR)	19
6.3 Physical Model of TCSC	20
6.4 Modes of Operation	21
6.5 Analysis of the TCSC Equivalent Circuit	22
6.6 Conclusion	26
Chapter : 7 Power Flow Solution of Electrical Network	27-47
7.1 Objective	27
7.2 Power Flow Solution	27
7.3 Bus Admittance Matrix	28
7.4 Power Flow Equation	29
7.5 Power Mismatch Equation	31
7.6 Net Active and Reactive Power	32

Enhancement of Power Flow using TCSC

7.7	Variables and Bus Type	32
7.8	Power flow Solution Method	33
7.9	Newton-Raphson Algorithm	33
7.10	Newton-Raphson Method Power Flow Problem	35
7.11	State Variable Initialization	37
7.12	Generator Reactive Power Limit	37
7.13	Generalised Power Flow Solution for 5-bus Network	38
7.14	Conclusion	47
Chapter : 8	Enhancement of Power Flow using TCSC	49-71
8.1	Active and Reactive power Flow through TCSC	49
8.2	Power Flow Solution for 6-bus Network	51
8.3	Power Flow Solution for 7-bus Network	62
8.4	Conclusion	71
Chapter : 9	Conclusion and Further Scope of Work	72-95
9.1	Summary of Work	72
9.2	Conclusion	73
9.3	Further Scope of Work	73
Appendix-A	MATLAB Program 3.1	74
	MATLAB Program 4.1	74
	MATLAB Program 5.1	75
	MATLAB Program 6.1	75
Appendix-B	MATLAB Program 7.1	77
Appendix-C	MATLAB Program 8.1	83
References		88-90