

**SELECTION OF TRANSMISSION NETWORK
CONFIGURATION FOR TRINCOMALEE POWER
PLANT GRID CONNECTION -
TECHNICAL AND FINANCIAL FEASIBILITY STUDY FOR
220kV/400kV CONFIGURATIONS**



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A dissertation submitted to the Department of Electrical Engineering, University of Moratuwa in partial fulfillment of the requirements for the Degree of Master of Science

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July 2010

Abstract

According to the Long Term Generation Expansion Plan 2009-2022 published by the transmission and Generation Planning Branch of Ceylon electricity Board there will be 1 our 250MW and 1 our 300MW coal plant units in Trineomalee area by the year 2020. Therefore a necessity Has arisen for identify, plan and formulaic the transmission grid connection for the above mentioned coal fired power plants. Because of the large quantity of power which has to be transmitted from the proposed trineomalee Power Station it has been decided to investigate the possibility of utilizing 400kV as the transmission voltage against the present practice of transmitting power using 220kV.

Detailed power system analysis consisting of load flow and stability studies were conducted under night peak and day peak loading conditions to identify areas where the planning criteria were violated using the Power System Simulator for Engineering' (PSS1-) software package. Conclusions of the most feasible transmission network configuration for power plant-grid connection were drawn based on all the above power system analysis results, economic analysis results and other concerns. Studies were conducted for year 2016 based on the "Long Term Transmission Development Plan 2008-2016*" and for year 2020 based on the Master Plan Study on the Development of Power Generation and Transmission System in Sri Lanka -January 2006.

It is possible to identify 220kV and 400kV transmission network configurations, which are capable of successfully transmitting 2200MW power generated at trineomalee Power Plant in year 2020. But the 220kV configuration is economically viable with compare to 400kV configuration for trineomalee Power Plant Grid Connection. By considering all the advantages and disadvantages of selected 220kV and 400kV transmission network configurations, it is recommended that 220kV configuration be used as the trineomalee Coal Fired Power Plant Grid Connection.

Declaration

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.

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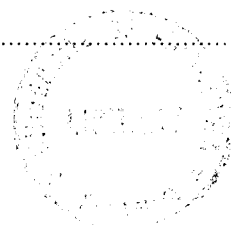
Abbreviations

BSC	Breaker Switched Capacitor
cct	Circuit
CEB	Ceylon Electricity Board
D/B	Double Bus Bar
FBs	Feeder Bays
FC	Foreign Cost
GBs	Generator Bays
GIS	Gas Insulated Switchgear
GS	Grid Substation
JICA	Japan International Cooperation Agency
LC	Local Cost
LKR	Sri Lankan Rupees
LTGEP	Long Term Generation Expansion Plan
PS	Power System
PSS/E	Power System Simulator for Engineering
TF	Transformer
TL	Transmission Line
SR	Successful Reclosing
SS	System Stable/Switching Station
S/B	Single Bus Bar
USR	Unsuccessful Reclosing
3PF	Three Phase Fault

Contents

Declaration	i
Abbreviations	ii
Contents	iii
Abstract.....	vi
Acknowledgement.....	vii
List of Figures.....	viii
List of Tables	ix
List of Annexes.....	xi
1. Background and Scope.....	1
1.1 Background.....	1
1.2 Problem Statement.....	1
1.3 Objectives	2
1.4 Methodology.....	3
2. Review of Trincomalee Power Plant Grid Connection for year 2016.....	4
2.1 Initial Transmission Network Configuration.....	4
2.1.1 Power Transmission Facility Related to Trincomalee Coal-Fired Thermal Plant.....	4
2.1.2 Construction of Kirindiwela 220/132kV Switching Station.....	5
2.1.3 Construction of Arangala 220/132kV Switching Station	5
2.2 Cost Estimation of Initial Transmission Network Configuration.....	6
2.2.1 Base Cost Estimation of the Initial Transmission Network Configuration.....	7
2.2.2 Disbursement Schedules and Total Cost Estimation of the Initial Transmission Network Configuration	8
2.3 Alternative 220kV Transmission Network Configurations for year 2016	9
2.3.1 Transmission Network with the new Loads of Northern Province	10
2.3.2 Trincomalee Coal Power Plant Grid Connection – Without Kirindiwela Switching Station.....	11
2.3.3 Trincomalee Coal Power Plant Grid Connection – Without New Habarana Switching Station.....	12
2.4 Steady State Analysis of Alternative 220kV Transmission Network Configurations for year 2016.....	13

2.4.1	Transmission Network with the new Loads of Northern Province	13
2.4.2	Trincomalee Coal Power Plant Grid Connection – Without Kirindiwela Switching Station.....	14
2.4.3	Trincomalee Coal Power Plant Grid Connection – Without New Habarana Switching Station.....	16
2.5	Economic Analysis of Alternative 220kV Transmission Network Configurations for year 2016.....	17
2.5.1	Trincomalee Coal Power Plant Grid Connection – Without Kirindiwela Switching Station.....	17
2.5.2	Trincomalee Coal Power Plant Grid Connection – Without New Habarana Switching Station.....	18
2.6	Evaluation of the Results of Alternative Transmission Network Configurations for year 2016.....	20
2.6.1	Transmission Network with the new Loads of Northern Province.	20
2.6.2	Trincomalee Coal Power Plant Grid Connection – Without Kirindiwela Switching Station.....	20
2.6.3	Trincomalee Coal Power Plant Grid Connection – Without New Habarana Switching Station.....	20
2.7	Transient Stability Analysis of Trincomalee Coal Power Plant Grid Connection – Without Kirindiwela Switching Station	21
2.8	Final 220kV Transmission Network Configuration for year 2016.....	22
3.	Selection of Trincomalee Power Plant Grid Connection for year 2020.....	24
3.1	Selected 220kV and 400kV Transmission Network Configurations for year 2020	24
3.1.1	220kV Transmission Network Configuration	24
3.1.2	400kV Transmission Network Configuration	27
3.2	Steady State Analysis of the Selected Transmission Network Configurations for year 2020.....	31
3.2.1	Steady State Analysis of 220kV Transmission Network Configuration	31
3.2.2	Steady State Analysis of 400kV Transmission Network Configuration	32
3.3	Transient Stability Analysis of the Selected Transmission Network Configurations for year 2020.....	34



3.3.1	Transient Stability Analysis of 220kV Transmission Network Configuration.....	34
3.3.2	Transient Stability Analysis of 400kV Transmission Network Configuration.....	35
3.4	Economic Analysis of the Selected Transmission Network Configurations	35
3.4.1	Base Cost Estimation of 220kV Transmission Network Configuration	36
3.4.2	Base Cost Estimation of 400kV Transmission Network Configuration	37
3.4.3	Disbursement Schedules and Total Cost Estimation of the Selected 220kV Transmission Network Configurations.....	38
3.4.4	Disbursement Schedules and Total Cost Estimation of the Selected 400kV Transmission Network Configurations.....	39
3.4.5	Economic Evaluation of Transmission Network Configurations for year 2020.....	39
4.	Conclusions.....	48
References:	51
Annexes	52



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Acknowledgement

First and foremost I offer my sincerest gratitude to my supervisors, Professor Rohan Lucas and Eng.W.D.A.S.Wijayapala, who had supported me by stimulating suggestions and encouraging throughout my dissertation with their patience and knowledge. Also my thanks should go to Dr. J. P. Karunadasa, Head of the Department of Electrical Engineering, and the other members of the academic staff of the Department of Electrical Engineering, for their valuable suggestions and comments.

In addition I would like to thank the officers in Post Graduate Office of the Faculty of Engineering of University of Moratuwa for helping in various ways to clarify the things related to my academic works in time with excellent cooperation and guidance. Sincere gratitude is also extended to the people who serve in the Department of Electrical Engineering office.

Especially I must be thankful very much to my colleagues in the Transmission Planning branch of Ceylon Electricity Board for providing assistance in numerous ways to carry out the studies of the project.

I express my thanks and appreciation to my family for their understanding, motivation and patience. Lastly, but in no sense the least, I am thankful to all colleagues and friends for giving their fullest co-operation throughout the time of research and writing of this dissertation.

List of Figures

Figure 2.1 Trincomalee Coal Power Plant Grid Connection According to the “ Long Term Transmission Development Plan 2008-2016”	6
Figure 2.2 Network with the new Loads of Northern Province.....	10
Figure 2.3 Trincomalee Coal Power Plant Grid Connection-Without Kirindiwela Switching Station.....	11
Figure 2.4 Trincomalee Coal Power Plant Grid Connection without New Habarana Switching Station.....	13
Figure 2.5 Final transmission network configuration for year 2016 system for Trincomalee Power Plant grid connection.....	23
Figure 3. 1 220kV transmission network configuration of Trincomalee Coal Power Plant Grid Connection According to the Master Plan Study	25
Figure 3.2 The proposed 220kV transmission network configuration of Trincomalee Coal Power Plant Grid Connection for year 2020	26
Figure 3.3 Relative Rotor Angle variation. following a three-phase short circuit fault in one circuit of the 400kV three-circuit 4xZebra transmission line between Trincomalee PS and Veyangoda GS.....	28
Figure 3.4 The proposed 400kV transmission network configuration of Trincomalee Coal Power Plant Grid Connection for year 2020	29

List of Tables

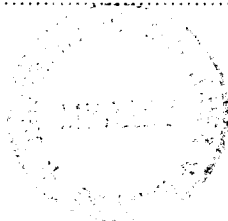
Table 2.1 Base Cost Estimation of Initial Transmission Network Configuration in year 2016	7
Table 2.2 Total Cost Estimation of Initial Transmission Network Configuration in year 2016.....	8
Table 2.3 Additional Loads of 2016 Power System in Liberated Areas of Northern Province	14
Table 2.4 Transmission Losses with and without Kirindiwela Switching Substation	14
Table 2.5 Contingency Results for Transmission Networks with and without Kirindiwela SS -Night Peak.....	15
Table 2.6 Contingency Results for Transmission Networks with and without Kirindiwela SS -Day Peak	15
Table 2.7 Transmission Losses with and without New Habarana Switching Substation	16
Table 2.8 Voltage violations without New Habarana SS	16
Table 2.9 Contingency Results for Transmission Networks without New Habarana SS	17
Table 2.10 Base Cost Estimation of Transmission Network Configuration-without Kirindiwela SS in year 2016.....	17
Table 2.11 Total Cost Estimation of Transmission Network Configuration-without Kirindiwela SS in year 2016 in year 2016.....	18
Table 2.12 Base Cost Estimation of Transmission Network Configuration-without New Habarana SS in year 2016.....	19
Table 2.13 Total Cost Estimation of Transmission Network Configuration-without New Habarana SS in year 2016.....	19
Table 2.14 Transient Stability Analysis Results of Trincomalee Coal Power Plant Grid Connection – With and Without Kirindiwela Switching Station	21
Table 3.1 Allowable voltage variations	31
Table 3.2 Voltage Levels and Loading Conditions after outage of critical 220kV Transmission Lines of selected 220kV Configuration	32
Table 3.3 Voltage Levels and Loading Conditions after outage of critical 220kV and 400kV Transmission Lines of selected 400kV Configuration.....	33

Table 3.4 Transient Stability Analysis Results of Selected 220kV Transmission Network Configuration of year 2020.....	34
Table 3.5 Transient Stability Analysis Results of Selected 400kV Transmission Network Configuration of year 2020.....	35
Table 3.6 Base Cost Estimation of Selected 220kV Transmission Network Configuration of year 2020.....	36
Table 3.7 Base Cost Estimation of Selected 400kV Transmission Network Configuration of year 2020.....	37
Table 3.8 Total Cost Estimation of Selected 220kV Transmission Network Configuration of year 2020.....	38
Table 3.9 Total Cost Estimation of Selected 400kV Transmission Network Configuration of year 2020.....	39
Table 3.10 Calculation of Present Value of Loss Saving	42
Table 3.11 Calculation of Present Value of Expenditures.....	44
Table 3.12 Calculated Load Factor values and corresponding Cost saving calculation	46



List of Annexes

Annex A- 1 2020 Transmission Network with 220kV Trincomalee Power Plant Grid Connection Configuration (Night Peak).....	53
Annex A- 2 2020 Transmission Network with 400kV Trincomalee Power Plant Grid Connection Configuration (Night Peak).....	54
Annex A- 3 Rotor angle variation following a three-phase short circuit fault in one circuit of the 220kV four-circuit 4xZebra transmission line between Trincomalee PS and New Habarana SS. (220kV Network, year 2020.Night Peak)	55
Annex A-4 Rotor angle variation following a tripping of one 300MW unit at Trincomalee power station. (220kV Network, year 2020. Night Peak)	56
Annex A-5 Rotor angle variation following a three phase short circuit fault in one circuit of the 220kV two circuit 4xZebra transmission line between New Habarana SS and Veyangoda GS. . (220kV Network, year 2020. Night Peak)	57
Annex A-6 Rotor angle variation following a three-phase short circuit fault in one circuit of the 220kV four-circuit 4xZebra transmission line between Trincomalee PS and New Habarana SS. (220kV Network, year 2020.Day Peak)	58
Annex A-7 Rotor angle variation following a three phase short circuit fault in one circuit of the 220kV two circuit 4xZebra transmission line between New Habarana SS and Veyangoda GS. (220kV Network, year 2020. Day Peak)	59
Annex A-8 Rotor angle variation following a three-phase short circuit fault in one circuit of the 220kV four-circuit 4xZebra transmission line between Trincomalee PS and New Habarana SS. (400kV Network, year 2020.Night Peak)	60
Annex A-9 Rotor angle variation following a tripping of one 300MW unit at Trincomalee power station. (400kV Network, year 2020. Night Peak)	61
Annex A-10 Rotor angle variation following a three phase short circuit fault in one circuit of the 220kV two circuit 4xZebra transmission line between New Habarana SS and Veyangoda GS. (400kV Network, year 2020. Night Peak)	62



Annex A-11 Rotor angle variation following a three-phase short circuit fault in one circuit of the 220kV four-circuit 4xZebra transmission line between Trincomalee PS and New Habarana SS. (400kV Network, year 2020, Day Peak)	63
Annex A-12 Rotor angle variation following a three phase short circuit fault in one circuit of the 400kV two circuit 2xZebra transmission line between New Habarana SS and Veyangoda GS. (400kV Network, year 2020, Day Peak)	64
Annex A- 13 Planning Criteria	65



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