

**IMPACT OF NEW GENERATION CONDUCTORS
ON TECHNO ECONOMICS OF 132kV
TRANSMISSION LINES.**

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Department of Electrical Engineering

University of Moratuwa Sri Lanka
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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree
Master of Science

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Demand for the electric power has been increasing rapidly due to human activities all over the world. It is essential to generate, transmit and distribute the power requirement to load centers as they demand. Therefore, Capacity of transmission network needs to be increased frequently either by uprating, upgrading of existing transmission lines or/and adding of transmission lines to the transmission network.

It is getting harder and harder to find routes for transmission lines due to increased social objection cause due to their uncountable social impact and environmental damage during the construction which cannot be totally compensated.

Therefore, requirement of delivering more power to the load centers through overhead conductors has come to a discussion and large variety of new generation conductors (HTLS - High Temperature Low Sag Conductors and LL-Low Loss conductors) are introduced with the intention of mitigating some of the disadvantages shown by the conventional conductors and to uprate and upgrade the existing transmission lines. Among them, enhanced power capacity, low loss performance, improved conductor sag behavior and anti-cohesiveness behaviors can be considered vital.

However, it can be observed that, conventional conductors are still used more frequently for new transmission lines by power utilities around the world due to lack of service experience in use of new generation conductors over conventional conductors that have been given a greater service in power transmission.

Therefore, impact of new generation conductors for on techno economics of 132kV double circuit transmission lines is studied by designing and modelling of transmission lines for different ground terrains with different types of new generation conductors over conventional conductor.

Accordingly, new generation conductors show promising results in overall techno economic viability of transmission line over conventional conductors, and among them low loss conductors show superior performance.

TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF FIGURES.....	vii
LIST OF TABLES.....	ix
LIST OF APPENDICES	xi
LIST OF ABBRIVIATIONS	xii
1.0 INTRODUCTION	1
1.1 BACKGROUND.....	1
1.2 OBJECTIVE.....	2
1.3 SCOPE OF WORK	2
2.0 LITERATURE REVIEW	3
2.1 OVERHEAD TRANSMISSION LINES	3
2.2 CONDUCTORS.....	4
2.2.1 Conductor Formation	4
2.2.2 Conductor Properties.....	10
2.2.3 Conductor Behavior	12
2.3 SUPPORT STRUCTURES.....	16
2.3.1 Structure	16
2.3.2 Loading Cases of Towers.....	21
2.4 SUPPORT FOUNDATIONS.....	24
2.4.1 Types of Loads on Foundations	24
2.4.2 Basic Design Requirements	24
2.4.3 Soil Parameters.....	24
2.4.4 Types of Soil	25
2.4.5 Types of Rocks.....	26
2.4.6 Structural Arrangement of Foundations.....	26
3.0 METHODOLOGY	29
3.1 PROCEDURE	29
3.2 GENERAL GUIDELINES	30
3.3 EXTENT OF STUDY	30
3.4 DESIGN PROCEDURE OF TRANSMISSION LINE.....	31



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3.4.1	Line Route Selection	31
3.4.2	Preliminary Survey.....	32
3.4.3	Fixing Angle Point, Finalizing the Line Route and Wayleaves.	32
3.4.4	Profile Survey.....	32
3.4.5	Sag Tension Calculations	32
3.4.6	Designing of Support Structures	33
3.4.7	Designing of Support Foundations.....	36
3.4.8	Profile Design.....	37
4.0	CONSTRUCTION OF NEW TRANSMISSION LINES.....	38
4.1	INTRODUCTION.....	38
4.2	ALGORITHM FOR TRANSMISSION LINE CONSTRUCTION.	38
4.3	POWER REQUIREMENT	39
4.3.1	Conductor Selection	40
4.4	LONG TERM PROFITABILITY	44
4.5	DESIGN OF SUPPORT STRUCTURES	47
4.5.1	Sag Tension Calculation.....	47
4.5.2	Loading of Support Structures	54
4.6	DESIGNING OF SUPPORT FOUNDATIONS	59
4.6.1	Loading on Foundations.....	59
4.7	EMF CONSIDERATION	63
4.8	TRANSMISSION LINE GROUND TERRAINS.....	64
4.8.1	Non Populated Flat Terrain	71
4.8.2	Populated Flat Terrain.....	71
4.8.3	Paddy Flat Terrain	72
4.8.4	Non Populated Hilly Terrain	73
4.8.5	Populated Hilly Terrain.....	74
4.8.6	Paddy Hilly Terrain	75
4.9	REDUCTION OF TOWERS	75
4.10	TRANSMISSION LINE FINANCIAL EVALUATION.....	76
5.0	RESULTS	77
6.0	CONCLUSION	82
	REFERENCES.....	84



LIST OF FIGURES

Figure 2.1 - Cross Section of ACSR Conductor	6
Figure 2.2 - Cross-section of LL-ACSR/AS Conductor	7
Figure 2.3 - Cross Section of G(Z)TACSR Conductor.....	7
Figure 2.4 - Cross Section of ACCC Conductor.....	8
Figure 2.5 - Cross Section of ZTACIR/AW Conductor	8
Figure 2.6 - Cross Section of ACSS Conductor.....	9
Figure 2.7 - Cross Section of ACCR Conductor.....	10
Figure 2.8 - Tower Anatomy.....	19
Figure 2.9 - Loads on Tower.....	23
Figure 2.10 - Pyramidal Type Chimney Foundation	27
Figure 2.11 - R.C.C Spread Type Foundation	28
Figure 3.1 - Design Procedure of Transmission Lines.....	31
Figure 4.1 - Algorithm for Construction of New Transmission Lines. [21].....	38
Figure 4.2 - Conductor Sag and Minimum Tower Height.....	50
Figure 4.3 - Plan view of Line Clearances of TD3 Tower.....	51
Figure 4.4 - Line Clearance Diagram, TDL Tower.....	51
Figure 4.5 - Line Clearance Diagram, TD3 Tower.....	52
Figure 4.6 - 3D Tower Models.....	53
Figure 4.7 - Tower Member Material	53
Figure 4.8 - Structure Member List	54
Figure 4.9 - Nuts and Bolts Sizes.....	54
Figure 4.10 - Loading Tree Model of a Transmission Tower.....	54
Figure 4.11 - Loading Cases for TD6 Tower.....	55
Figure 4.12 - Loading Points of Tower.....	56
Figure 4.13 - Failure of Tower Members due to Application of Loads.....	56
Figure 4.14 - Optimized Tower, After Replacing Failed Members.....	57
Figure 4.15 - Data feeding for Type 3 Foundation for TDL Tower	61
Figure 4.16 - Design Output for Type 3 Foundation for TDL Tower	61
Figure 4.17- Foundations Schedule	62
Figure 4.18 - Electric Field Strength vs. Ground Clearance	64
Figure 4.19 - Type of Terrain Models.....	66

Figure 4.20 - Feature Code List	68
Figure 4.21 - Profile Generated form PLS-CADD	68
Figure 4.22 - Weather Cases	68
Figure 4.23 - Cable Tension Criteria	69
Figure 4.24 - ACSR Zebra Cable File.....	69
Figure 4.25 - Section Modifier.....	70
Figure 4.26 - Flat None Populated Terrain (Mahiyangana-Vavunathivu Line at Aranthalawa).....	71
Figure 4.27 - Flat Populated Terrain (Pannipitiya - Padukka Line at Pannipitiya) ...	72
Figure 4.28 - Flat Paddy Terrain (Mahiyangana-Vavunathivu Line at Mahaoya)	72
Figure 4.29 - Hilly Non Populated Terrain (Maliboda-Polpitiya Line at Polpitiya)..	73
Figure 4.30 - Hilly Populated Terrain (Ragala -Pallekele Line at Rikillagaskada) ...	74
Figure 4.31 - Hilly Paddy Terrain (Ragala - Pallekele Line at Hanguranketha)	75



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LIST OF TABLES

Table 2.1- Properties of Outer Layers Materials, [6].....	5
Table 2.2- Properties of Core Materials, [6].....	5
Table 2.3 - Current Carrying Capacity of ACSR Zebra Conductor.....	13
Table 3.1 - Loading and Temperature for Conductor, GSW and OPGW.....	32
Table 3.2 - Line Clearance [8]	33
Table 3.3 - Temperatures of Conductors and GSW, [8]	33
Table 3.4 - Assumed Wind Loading, [8]	33
Table 3.5 - Wind Span, [8].....	34
Table 3.6 - Weight Span for TDL Tower, [8].....	34
Table 3.7 - Weight Spans for Angle Towers, [8].....	34
Table 3.8 - Electrical Clearances for Supporting Structures. [8].....	35
Table 3.9 - Schedule of Foundation Design. [8].....	36
Table 3.10 - Electrical Clearances. [8].....	37
Table 4.1 - Environmental Factors.....	39
Table 4.2 - ACSR Conductor Properties.....	39
Table 4.3 - CCC Results for ACSR Zebra.....	39
Table 4.4 - CCCs of Different Transmission Line Configuration	40
Table 4.5 - Conductors' Properties (Rated Load Condition).....	41
Table 4.6 - Environmental Factors.....	41
Table 4.7 - CCC Calculations (Rated Load Condition).....	42
Table 4.8 - Conductor Properties (Low Load Condition).....	43
Table 4.9 - CCC Calculations (Low Load Condition).....	44
Table 4.10 - Factors for Energy Evaluation.....	45
Table 4.11 - Line Loss Evaluation (Rated Load Condition).....	45
Table 4.12 - Line Loss Evaluation (Low Load Condition).....	46
Table 4.13 - Properties of Conductor, GSW and OPGW	48
Table 4.14 - Sag Tension Summary - Conductor.....	48
Table 4.15 - Sag Tension Summary - GSW.....	49
Table 4.16 - Sag Tension Summary - OPGW.....	49
Table 4.17 - Sag Tension Summary.....	50
Table 4.18 - TDL Towers Heights.....	52

Table 4.19 - Simulated Tower Weights	57
Table 4.20 - Tower Price Schedule	58
Table 4.21 - Leg Reaction of Foundation for TDL Tower	60
Table 4.22- Foundation Price Schedule	62
Table 4.23 - EMF Exposure Limits	63
Table 4.24 - Setting Data for 132kV Transmission Line.....	63
Table 4.25 - EMF Simulation Results for 132kV Transmission Line	63
Table 4.26 - Survey Data and Feature Codes.....	67
Table 5.1 - Energy Loss Evaluation for Rated load Conditions.	77
Table 5.2 - Energy Loss Evaluation for Low Loading Conditions.....	78
Table 5.3 - Capital Cost Model for Terrain Models	78
Table 5.4 - 40 Year Cost Benefit Analysis Compared to ACSR Zebra Conductor..	79
Table 5.5 - 40 Year Cost Benefit Analysis for Medagama Monaragala Line	79
Table 5.6 - 40 Year Cost Benefit Analysis for Mahiyangana Vavunathivu Line.....	80
Table 5.7 - Cost Percentage Summary for Hilly Populated Terrain Line.....	80
Table 5.8 - Cost Percentage Summary for Flat Non-Populated Transmission Line..	81
Table 5.9 - No. of Tower Usage for Different Conductors.....	81



LIST OF APPENDICES

APPENDIX I: Sample Result Steps for Sag Tension Calculation.....	86
APPENDIX II: Sample Calculation for CCC	87
APPENDIX III: Energy Loss Calculation	89
APPENDIX IV: Sample Load Calculation for TDL Tower	91
APPENDIX V : Sample of Tower Simulation Report.....	102
APPENDIX VI: Profile Design Summary Report.....	105
APPENDIX VII : Material Schedules of Transmission Lines.....	110
APPENDIX VIII: Sample Price Schedule	121
APPENDIX IX : Total Cost Summary for Respective Terrain Models	124



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LIST OF ABBRIVIATIONS

Abbreviation	Description
ACSR	- Aluminium Conductor Steel Reinforced
AAAC	- All Aluminium Alloy Conductor
ACCC	- Aluminum Conductor Composite Core Conductor
ACCR	- Aluminum Conductor Composite Reinforced
ACSS	- Aluminum Conductor Steel Supported Conductor
CEB	- Ceylon Electricity Board
TCR/L	- Top Conductor Right/Left Side
MCR/L	- Middle Conductor Right/Left Side
BCR/L	- Bottom Conductor Right/Left Side
ROW	- Right of Way
HTLS	- High Temperature Low Sag
LL	- Low Loss
EMF	- Electromagnetic Field
KPT	- Knee Point Temperature
TACSR	- Thermal Resistant Aluminium Alloy Conductor Steel Reinforced
ZTACIR	- Thermal Resistance Aluminium Conductor Steel Reinforced
CCC	- Current Carrying Capacity
NPV	- Net Present Value
IEE	- Initial Environment Examination
PGR/L	- Peak Ground Right/Left Side
POR/L	- Peak OPGW Right/Left Side



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