

Eskom Power Series

Volume 6 (Part 2)

High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Transmission Line Towers

Who should read this book?

This book is for those practitioners, specialists, technical managers, contractors, engineers in training and professional engineers who want to better understand the forces that act on transmission line towers, the geometry and the erection of the towers.



What does this book cover?

High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Transmission Line Towers (Volume 6 (Part 2) in the Eskom Power Series) takes the reader through the philosophy, theory, principles and practices of the design and fabrication of overhead power line structures.

The author begins with an analysis of the mechanical forces that overhead power line towers are required to withstand. Once the nature of the forces on towers is understood, the book proceeds to discuss the geometry of towers. The many solutions designers have found for single- and multi-circuit lines, flat, vertical and delta configurations of the phases and for self-supporting and guyed towers are illustrated.

The vast majority of towers are fabricated from lattice steel angle members. The author introduces the fundamentals of force diagrams and graphical techniques for the calculation of forces in the tower members, and moves on to introduce finite element and computer methods.

The book continues with the practical design of real towers using European and American standards. Client specifications lay down the requirements for a particular project. The designer's role is to interpret these specifications and create the structures that technically and economically satisfy the requirements. The development of a typical range of towers for EDF is described.

Power line towers are expected to resist environmental degradation for upwards of fifty years. The most successful protection is a sacrificial zinc coating applied to the steel members in a hot-dip galvanization process. The book describes the chemistry, physics and metallurgy of this process.

The power line tower is one of few engineering structures that is routinely subjected to full-scale mechanical testing. The book concludes by describing the procedures followed at major test stations around the world.

Contents of the book

Chapter 1:	External Elements Acting on the Towers
Chapter 2:	Mechanical Design of Towers
Chapter 3:	Forces Acting on Transmission Towers
Chapter 4:	Geometry of Towers
Chapter 5:	Lattice Towers
Chapter 6:	Basic Principles in the Calculation of the Resistance of Materials in Metallic Towers
Chapter 7:	Methods Used for the Verification of the Constituent Elements of a Tower
Chapter 8:	Static Calculations of Towers
Chapter 9:	Detailed Plans and Tower Construction
Chapter 10:	Galvanization of Towers
Chapter 11:	Tower Testing

Plus four Appendices

What other books are available?

Volume 1: The Planning, Design and Construction of Overhead Power Lines (pp 772), ISBN No. 978-0-620-33042-8

Volume 2: Fundamentals and Practice of Overhead Line Maintenance (pp 258), ISBN No. 0-620-30906-7

Volume 3: The Practical Guide to Outdoor High Voltage Insulators (pp 224), ISBN No. 0-620-31074-X

Volume 4: Inductive Instrument Transformers and Protective Applications (pp 860), ISBN No. 0-620-37865-4

Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers (pp 337), ISBN No. 978-0-620-38294-6

Volume 6 (Part 1): High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Conductor Installations (pp 349), ISBN No. 978-0-620-42834-7

Volume 7: Corona in Transmission Systems: Theory, Design and Performance (pp 528), ISBN No. 978-0-620-49388-8

Volume 8: Power Quality in Electrical Power Systems: A Holistic Approach (pp 665), ISBN No. 978-0-9921781-2-3

Volume 9 (Part 1): HVDC Power Transmission: Basic Principles, Planning and Converter Technology (pp 832), ISBN No. 978-0-9921781-0-9

Volume 10: Thermodynamics for Students and Practising Engineers (pp 262), ISBN No. 978-0-992-17811-6

Volume 11: Thermal Science for Engineers (pp 303), ISBN No. 978-0-992-17813-0

What books are in development?

- The Engineer's Toolkit
- HVDC Power Transmission (Part 2)
- Power Station Chemistry Book
- High Voltage Overhead Power Lines: Construction Works
- Fly Ash Properties and Utilisation Book (Parts 1 to 6)
- Insulating Fluid for the Electrical Engineering Industry
- AC Substation Design Handbook
- Coal Classification and Utilisation Book

Where can I purchase copies?

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