

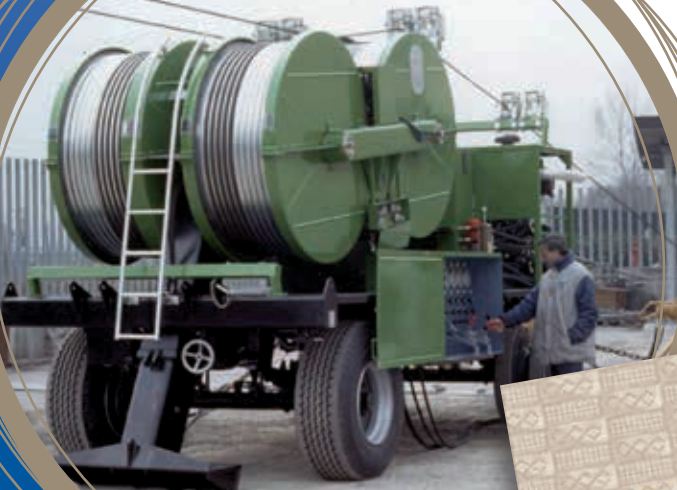
Eskom Power Series

Volume 6 (Part 1)

High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Conductor Installations

Who should read this book?

Currently, most calculations required to install power line conductors are provided by computer programs. However, in order to be able to interpret computer generated results safely, it is essential that students, line engineers and contractors understand the essentials. This book is an invaluable source of the fundamental mathematics underlying these programs.



What does this book cover?

The electrical conductors of overhead power lines are the most important and most expensive parts of a power line. To the layman, it appears simple to suspend conductors from towers. In reality, a complex series of processes is required from the original design of the cables through the initial stringing of the cables on the towers to the final tensioning. Every step is designed to avoid damage to the conductors or the environment, to provide proper clearances to obstacles and to keep loads within the capabilities of the towers.

High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Conductor Installations (Volume 6 (Part 1) in the Eskom Power Series) covers every aspect of these processes in theoretical and practical detail.

When a wire is hung from two points, the shape of the resulting curve is a catenary. The author develops the fundamental equations describing this curve from first principles and proceeds to apply them to practical examples. Real conductors do not conform exactly to a catenary and, in practice, the equations can be replaced by simpler parabola, which are a close approximation to a catenary and, in most cases, give results with minor error.

Once the fundamental algebra has been developed, the author introduces practical conductors in use on real lines. Modern conductors are manufactured from aluminium or aluminium alloys, often reinforced with steel. The physical properties of these conductors are discussed and their strengths and weaknesses explained.

The conductors for modern high voltage lines are strung on the towers without touching the ground to avoid damage to the surface of the conductors as well as to crops and other features on the ground. The procedures, mathematics and necessary machinery are comprehensively covered.

Once the conductors are slackly installed it is necessary to tension them to provide electrical clearance to the ground and other obstacles. However, tensioned conductors are susceptible to destructive vibration from the wind. The conflicting demands are thoroughly discussed in this book and the correct procedures are described.

Contents of the book

Chapter 1:	Shape of the Equilibrium Curve of Conductors
Chapter 2:	Characteristics of the Conductors
Chapter 3:	Equation of Change of State
Chapter 4:	Stringing of Conductors
Chapter 5:	Regulating the Conductors

Plus nine 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 2): High Voltage Overhead Power Lines: Theoretical Calculations and Formulae for Transmission Line Towers (pp 378), ISBN No. 978-0-620-46585-4

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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