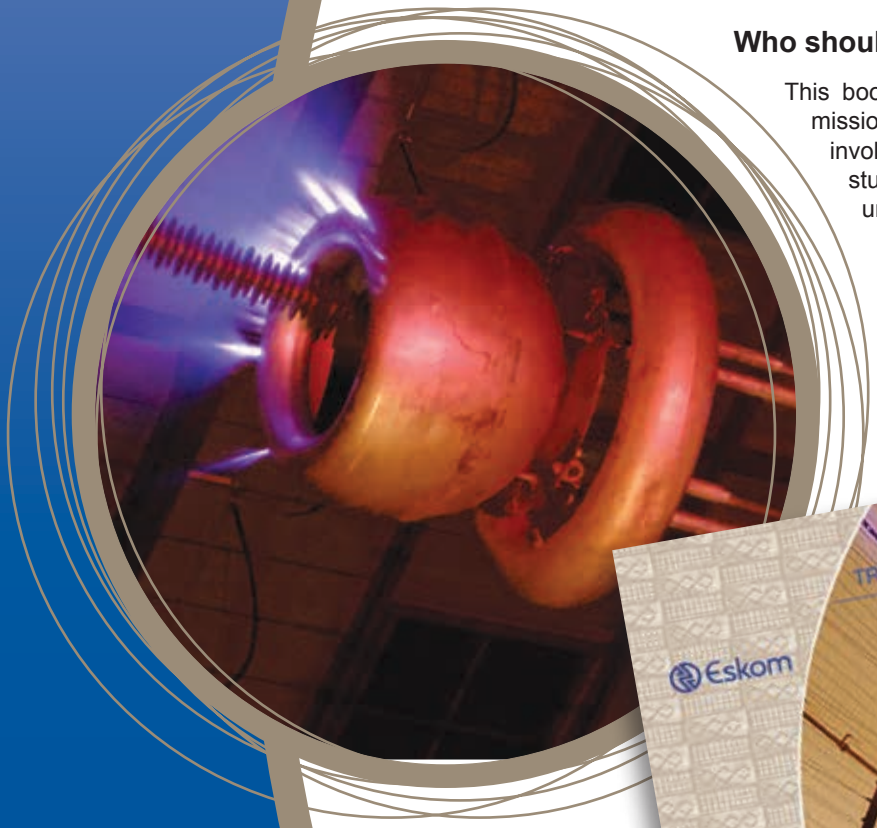
Eskom Power Series

Volume 7

Corona in Transmission Systems: Theory, Design and Performance



Who should read this book?

This book is an invaluable resource for transmission line design engineers and for those involved in carrying out corona research studies as well as for developing university undergraduate and graduate courses.

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What does this book cover?

The South African high voltage network includes lines that operate at voltages up to 800 kVac and ±533 kVdc. Increasing demand for electric power in South Africa as well as other countries around the world has led to the expansion of power networks and the use of transmission voltages up to 1 200 kVac and ±800 kVdc. Corona and related effects play an important role in the electrical design and performance of existing and planned ac and dc transmission lines.

Corona in Transmission Systems: Theory, Design and Performance (Volume 7 in the Eskom Power Series) is a comprehensive reference book on the corona design and performance considerations of high voltage ac, dc and hybrid ac/dc transmission lines. While corona losses may have an impact on the economic choice of conductors, radio interference and audible noise are the principal environmental consequences of corona on ac and dc line conductors. In some cases, the radio interference, because of its influence on power line carrier performance, can be an additional factor. The corona-generated space charge environment is also an important design consideration in the case of dc and hybrid ac/dc transmission lines.

Treatment of the physical, analytical and experimental aspects of corona performance of ac and dc transmission lines is presented in this book. Example calculations are included throughout in order to provide a better understanding of the analytical techniques presented and of the orders of magnitude involved. Explanatory photographs, diagrams, tables and graphs complement the text. Development of criteria and methodologies for the corona design of ac and dc transmission lines and their application to typical cases are also described.

Contents of the book:

Chapter 1: Basic Concepts
Chapter 2: Corona and Gap Discharges
Chapter 3: Conductor Surface Electric Fields
Chapter 4: Corona Loss and Ozone from AC Lines
Chapter 5: Electromagnetic Interference from AC Lines
Chapter 6: Audible Noise from AC Lines
Chapter 7: Space Charge Environment and Corona Losses of DC Lines
Chapter 8: RI and AN of DC Lines and Corona Performance of Hybrid AC/DC Lines
Chapter 9: Measurement Methods and Test Techniques for Corona Performance Evaluation
Chapter 10: Corona Design Considerations for AC and DC Lines

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 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 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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