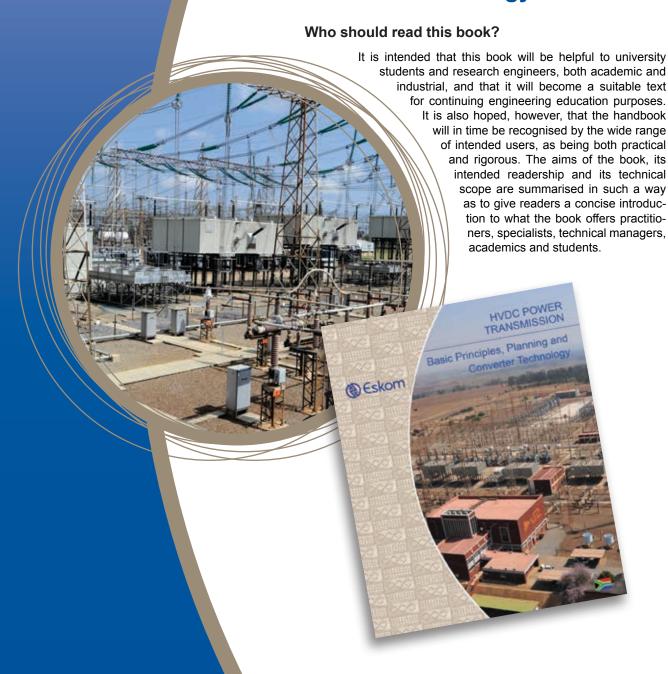
## **Eskom Power Series**

# Volume 9 (Part 1)

# HVDC Power Transmission: Basic Principles, Planning and Converter Technology





#### What does this book cover?

In the period 2000 to mid-2012, the installed capacity of High Voltage Direct Current (HVDC) systems increased by some 60 GW worldwide, bringing the total to in excess of 110 GW. The growth has been due mainly to new, long (electrical) distance connections, to supply a rapidly growing demand for electrical energy, or to accommodate renewable power by the provision of connections and new interconnections between networks. HVDC is used because it is the most economical solution. This growing trend is set to increase. Therefore, there is considerable interest in HVDC and its technical attributes. The book has been written to support this need, and collates a comprehensive spectrum of information compiled by eminent experts in HVDC.

HVDC Power Transmission: Basic Principles, Planning and Converter Technology (Volume 9 (Part 1) of the Eskom Power Series) focuses on Line Commutated Converter (LCC) HVDC, which at the time of writing is the majority technology. Voltage Sourced Converter (VSC) HVDC is also covered briefly, since this technology is growing rapidly. The book deals with the theory and principles of HVDC transmission, how it compares technically and economically with High Voltage Alternating Current (HVAC) transmission, the management of its environmental and technical impact, planning studies and the implementation of the main power components and the control and protection of the HVDC converter station.

#### Contents of the book:

Chapter 1: Introduction

Chapter 2: The HVDC Project: Preparatory and

Complementary Activities

Chapter 3: Principles of Operation of Converters
Chapter 4: HVDC Schemes and Applications

Chapter 5: Technical Comparison of AC and DC

Transmission

Chapter 6: Modelling for HVDC Studies

Chapter 7: AC/DC Interaction and System Dynamic

Behaviour

Chapter 8: Environmental Impact

Chapter 9: Performance of Existing Systems

Chapter 10: Converter Station Design

Chapter 11: Power Semiconductors for HVDC

**Applications** 

Chapter 12: Thyristor Valves

Chapter 13: Converter Transformers

Chapter 14: DC Controls

Chapter 15: Implementation of Control, Protection and

Instrumentation

Chapter 16: Harmonic Filtering

Chapter 17: Insulation Co-ordination for HVDC Converter

Stations

Chapter 18: Electromagnetic Compatibility

Chapter 19: Audible Noise from Converter Stations

Chapter 20: Operation and Maintenance of Converter Stations

Chapter 21: VSC HVDC Transmission
Chapter 22: Technological Trends in HVDC

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### 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)
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