

Red Book: The Essential Transmission Line Reference

EPRI's Renowned Reference Book on Transmission Line Design—Extensively Updated and Expanded (Together with Software)—Is Now Available at a New Low Price and EPRI Membership Is No Longer Required for Purchase

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**EPRI AC Transmission Line
Reference Book—200 kV and
Above, Third Edition**



“The Red Book has been recognized for more than 25 years as the worldwide industry standard for transmission line design. The latest update represents a significant advance on the previous edition, last published in 1987. It provides a much-needed reference tool for transmission design engineers today, and for years to come.”

—Andrew Phillips, Senior Program Manager,
Transmission, Electric Power Research Institute

Today's transmission line designers need access to the latest and best knowledge and techniques to increase reliability and reduce capital, O&M, and life-cycle costs. To meet this need, the new version of EPRI's flagship reference book delivers the latest information on research, technology and materials associated with the design of high-voltage overhead transmission lines.

The Industry-Standard Reference

The hugely popular EPRI report, *Transmission Line Reference Book, 345 kV and Above* (EL-2500), was originally printed in 1975 with a red cover and quickly became known as the “Red Book.” Just as quickly, it became the worldwide industry standard reference for transmission line design. Over the past two decades, the Red Book has been in daily use throughout the global power industry.

The Red Book was updated in 1982 and again in 1987. In 2001, EPRI recognized that theories and technologies related to transmission line design had advanced, and the Red Book had fallen behind. EPRI assembled a global team of experts to upgrade and expand the guidebook to again be an essential reference.

Expanded New Edition

In 2005 EPRI reissued the guidebook with the new title, *EPRI AC Transmission Line Reference Book: 200 kV and Above, Third Edition* (EPRI Product 1011974). Four years in development, the new version preserves the style and depth of previous editions, while including new and expanded information. Eleven chapters were extensively updated and four new chapters were added. In addition to the revised text, the new edition of the Red Book also includes 50 applets—small software programs, or stand-alone calculation modules. The applets enable users to exercise and implement calculations based on the theories and principles described in the Red Book. The applets not only reduce the effort necessary to implement the knowledge in the reference guide, they also aid in increasing the reader's understanding of the principles and the effects of changes in transmission line parameters on the line's performance.

The revised edition includes three general themes:

- **Insulation Coordination.** This theme spans Chapters 3 to 6, and covers general insulation coordination, power frequency insulation, switching, and lightning and grounding.
- **Corona and Field Effects.** This theme spans Chapters 7 to 11, and covers corona and its effects (corona loss, audible noise, and high-frequency electromagnetic interference) and the effects of power frequency electric and magnetic fields.
- **Application.** This theme spans Chapters 12 to 15, and includes right-of-way management, designing for inspection and maintenance, voltage upgrading, and the field performance of lines designed to operate above 700 kV. This theme is a new addition to the book.

Chapter 15 is particularly noteworthy. The authors surveyed some 10 utilities around the globe that have transmission lines above 700 kV. The chapter starts with a history and EHV and UHV transmission research and then presents a design review of each line—covering the reasons why the technology was chosen, the approach to the design, and the operation and maintenance experience.

The new guidebook also contains a number of useful additions:

- **Glossary.** A glossary provides definitions based on both IEEE and IEC terminology.
- **Base Cases.** To help demonstrate the theory, a large number of base cases are provided. These base cases are loaded into the applets. The base cases help the reader exercise the theory and also gauge the technical limits of various line design parameters.
- **Index.** Previous editions of the book did not contain an index. While each chapter is self contained, the index helps readers find the right information across the entire handbook.

Availability and Pricing

When the Red Book was first published in 2005, its distribution was limited to qualified funders of EPRI's Overhead Transmission Program. As of May 2007, the Red Book is available to all at reduced pricing.

Single copies of the Red Book are available for purchase at \$5,000 per hardcover copy. Included with the hardcover copy is a CD-ROM with hyperlinked applets.

Additionally, EPRI Members that elect to purchase 10 copies at one time (\$50,000) will be able to download electronic copies of this report from this web site. Currently eligible members and those who elect to purchase 10 copies for \$50,000 may purchase additional copies at a price of \$100 each. These conditions are limited to this edition only and may be changed at any time.

Special pricing is available for qualified United States educational institutions.

What They're Saying

"I often refer to the Red Book before addressing a technical issue." – Mike Fourman, Georgia Transmission Corporation

"I refer to the Red Book before I go out to do specific work or evaluate a problem such as lightning, RFI and TVI field work, and corona." – Wade Eckler, NYPA


How to Purchase

To purchase the Red Book, or for more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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