

EPRI Underground Transmission Systems Reference Book—2006 Edition: The “Green Book”

This new edition of a landmark reference captures the current state of the art in the field of underground transmission cables.

The Electric Power Research Institute (EPRI) is pleased to present the *EPRI Underground Transmission Systems Reference Book—2006 Edition* (EPRI Product 1014840). The book covers all stages of cable system design and operation, from initial planning studies to failure analysis. It contains contributions from many of the industry’s experts and represents practices both in North America and internationally.

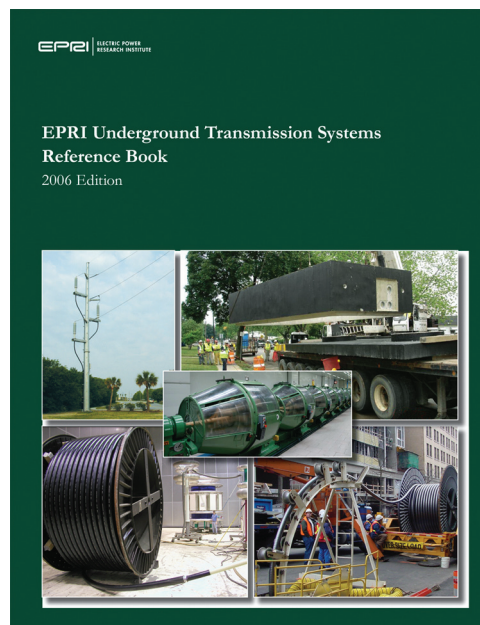
The 2006 edition is a thorough revision and updating of the widely used 1992 edition of the same title, commonly known as the “EPRI Green Book” because of its distinctive green binding.

Application and Value

The new edition of the Green Book is a state-of-the-art desk and field compendium on underground cable systems. The new edition will enable energy companies to simplify the design and reduce the cost of new extruded and traditional pipe-type cable systems. Although the Green Book compiles a wealth of information, it is not intended to provide an exhaustive treatment of all subjects associated with the underground cable industry—more detail is available in the references cited in the book. Instead the book serves as a handy reference guide, compiling a large amount of information in one place. For example, design engineers can use the book as a checklist to determine the relevant issues that must be addressed in the design phase of a project; the tradeoffs are identified but not necessarily solved. The book can also serve as a basis for training new cable engineers. When used in conjunction with EPRI’s Underground Transmission Workstation, it brings new cable engineers up to speed more quickly, thereby saving time and money.

New Material and Organization

The content of the earlier edition has been significantly expanded and updated to reflect the latest technology, new materials and methods, recently issued standards and regulations, and current utility needs and practices. Separate chapters provide detailed information on extruded-dielectric, pipe-type, and self-contained fluid-filled cables. Coverage includes special application cables—gas-insulated lines, dc cables, and long-length submarine and superconducting cables. New chapters address hydraulic design and grounding as well as cathodic protection. The new



book also incorporates more of an international perspective on underground transmission design and use. The editorial team made the Green Book more user friendly—including reorganizing chapters to make information easier to find and expanding the glossary and index.

Audience and Scope

The intended users of the Green Book are utility underground transmission design engineers, consultants, engineers moving into underground transmission, and university engineering students preparing for careers in the power industry.

Addressing issues related to the aging workforce and the continuing loss of utility expertise, the Green Book strives to preserve the institutional knowledge that is being eroded in today’s downsized and restructured industry. Engineers in utility organizations with even modest or minimal preparation or background in the specifics of underground transmission systems will benefit from the tutorial nature of the book, while experienced professionals will find the technical depth they need to carry out their assignments.

To make it manageable in size, the book does not include fundamental derivations and tables, as these are widely available in standard textbooks and other references. The recommended minimal technical preparation needed to fully use the book is third-year college engineering or physics. Finally, recognizing that a significant portion of today's design and manufacturing of transmission cable systems occurs outside North America, attempts were made to expand the focus of the Green Book to include international practice and terminology. To that end, a number of chapters have international co-authors or reviewers.

Training

In addition to providing an essential reference to practicing engineers, the Green Book can also serve as a basis for training new cable engineers. When used in conjunction with EPRI's Underground Transmission Workstation, the reference enables engineers in training to come up to speed more quickly, thereby saving time and money.

Beginning in the fourth quarter of 2008, EPRI will offer training seminars structured around the topics presented in the book. These "Green Book Seminars" will introduce attendees to the book's diverse subject matter, with lectures delivered by many of the experts who wrote the topical chapters. In addition to classroom instruction, the five-day seminars will offer a field day that gives participants the opportunity to experience firsthand the electrical phenomena, engineering principles, and technologies covered in the lectures. The seminars will be offered at EPRI regional centers and on-site at individual utilities, where course content can be tailored to a utility's specific needs.

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