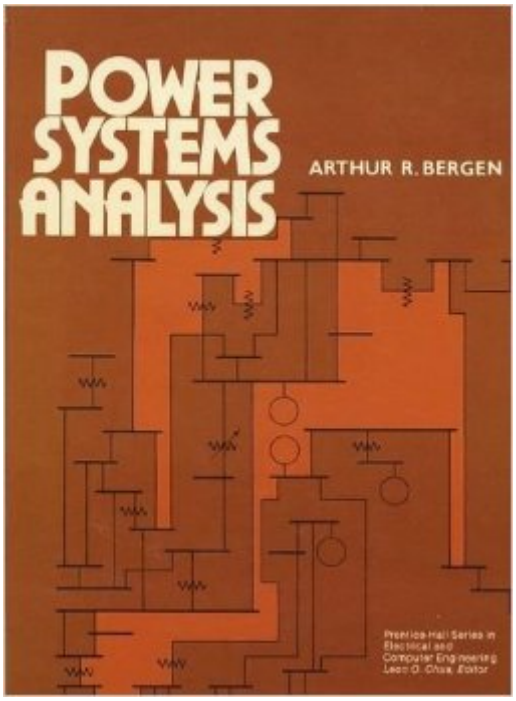
Power Systems Analysis (Prentice-Hall Series In Electrical And Computer Engineering)



Synopsis

This is the first book on power system analysis to explore the major changes in the structure and operation of the electric utility industry, and to show how power system operation will be affected by the new changes. It reflects the trends in state-of-the-art, computer-based power system analysis and shows how to apply each modern analysis tool in designing and improving an expansion of an existing power system. KEY FEATURES: Features a computer-based design example (carried out from chapter-to-chapter) which uses all the analysis. As the example develops, readers determine the parameter values for a proposed transmission system upgrade to support load growth and a new steel mill being located in the area; convert all the parameters to per unit -- the preferred choice of units for system analysis; determine typical parameters for the generators in the system being designed; develop the admittance matrix and the impedance matrix for the system being designed; conduct the power flow and check the designed system for possible violations, and appropriately modify the design; and conduct a contingency analysis on the designed system; analyze the behavior of the designed system under faulted condition; continue the design with a selection of relay settings to protect the system in the event of these faulted conditions; and perform a transient stability simulation on the system and verify the ability of the system to remain stable. For engineers working in the electric utility industry. --This text refers to the Paperback edition.

Book Information

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Customer Reviews

As a teacher and researcher working in the power systems area for more than 35 years, I have great pleasure in welcoming a revised edition of Art Bergen's classic book on Power Systems Analysis. When the first edition came out in 1986, it was a trend setter for those entering an academic career. The presentation was fresh and different with challenging problems added to each chapter. The book combined control system concepts with power system models and provided insight into dynamic operation of power systems.In the last three decades, power system analysis has made great progress and mathematical techniques of optimization and matrix analysis have become entrenched in problem solution. Matlab has become de facto tool for use in the class room. The revised edition recognizes these facts, and without affecting the originality of the first edition supplements material that is indispensable to any student of power systems.It is a difficult balancing act to provide the required mathematical knowledge without losing track of the practical nature of power systems. I feel that Vittal has achieved this.There is a number of other books on power system analysis in the market, but the approach in most of the cases is similar to the classic book of Stevenson.I would recommend the book for a senior level power system course in a 4-year program and as a reference to graduate students requiring a foundation in power systems.

Riddled with errors and typos, this book has nothing new to offer. For the beginning student, the only new book on the market that seems to be good is Power System Analysis and Design by Glover et al. Power Systems Analysis by Vittal (the book I'm reviewing) has unclear wording, strange ordering of topics, and is in general more difficult to read than other texts. Sometimes, it is really terse when it should not be. I should note that every other book I've read on the subject is better (including the text by Stevenson, the text by Glover, and the text by El-Hawary). However, this book has its strong points and could be of definite interest to some graduate students. All in all, it is not well-suited for beginners as it is sketchy and explains many concepts poorly. I have found El-Hawary's text Electric Power Systems to be unbelievably clear and uncluttered in presentation. I would supplement that text with the more up-to-date text by Glover for a nice introduction to the subject. Finally, I should say that it seems that Vittal's text was mostly copied from the text by Stevenson; it lacks originality. I give it two stars because it does get the point across in most cases, but it is generally a weak textbook.

This reviewer has almost 30 years in the electric power and electrical engineering industry. This book is NOT a good book for an introductory course in electric power systems. The authors are obviously too interested in lecturing to audiences using somewhat obscure and superfluous

mathematics, rather than teaching what otherwise should be a sensible and lucid course in electric power systems. In fact, the instruction in electric power systems is almost wholly obfuscated by its focus on mathematical irrelevancy. The book attempts to use too much of an "electronics" approach, e.g., one-port systems notation, control theory, linear systems analysis (matrix mathematics) etc., and circumvents clear description and use of electric power system analytical practices that would be of much more use to future power engineers. The weighty matrix applications are tiring, inefficient, and unnecessary, and as applied to electric power systems analysis, should be reserved for large network analysis, rather than as applied throughout this book. This book would never be retained by students for use in their professional careers as "working" power engineers. Professors who use this book in their classes are careless, irresponsible, or ignorant of what the power industry requires of its engineers. Because more universities are using such books, it is clear why so many graduating power engineers are appearing in the electric power industry without any ’60-cycle’ knowledge, and proving themselves unprepared to conduct even the most basic electric power analyses. Far superior books would include: Theodore Wildi’s, "Electrical Machines, Drives, and Power Systems", or Robert Eaton’s, "Electric Power Transmission Systems." In summary, this book should be re-titled as, "Mathematics for Power Systems Analysis".

This is a superior textbook for a senior level course in power systems analysis. Readers expecting an introductory text are barking up the wrong tree. The strength of Bergen and Vittal is in its rigorous mathematical approach to power system analysis. The math is at the core of the analytical programs that permeate practical power systems engineering today. Those seeking to write such programs, or to use them intelligently, will have Bergen and Vittal in their library and refer to it often. Compared to Glover and Sarma or Stephenson (both decent texts themselves), Bergen and Vittal goes one level deeper in detail.

I work for an electrical utility now, and when I bought this I was a student tearing my hair out over my first power systems classes at university. If you’re buying this, you’re probably a student and have to buy it because it’s required for your class. But do yourself a favor, and unless you drop the class and decide that power systems isn’t for you, do not under any circumstances sell this book back. Keep it, it will be a very useful resource in the future. 90% of the stuff that’s in this book I use only on a few rare occasions, and it’s really nice to have the reference there when I need to make some kind of an unbalanced fault current calculation or something.

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