Electromagnetic Transient Analysis and Novel Protective Relaying Techniques for Power Transformers
Xiangning Lin, Jing Ma, Qing Tian, Hanli Weng

**ISBN: 978-1-118-65385-2**
November 2014  $129.99

**ISBN: 978-1-118-65382-1**
March 2015  $161.25

**ISBN: 978-1-118-65383-8**
June 2015

**DESCRIPTION**

An advanced level examination of the latest developments in power transformer protection

This book addresses the technical challenges of transformer malfunction analysis as well as protection. One of the current research directions is the malfunction mechanism analysis due to nonlinearity of transformer core and comprehensive countermeasures on improving the performance of transformer differential protection. Here, the authors summarize their research outcomes and present a set of recent research advances in the electromagnetic transient analysis, the application on power transformer protections, and present a more systematic investigation and review in this field. This research area is still progressing, especially with the fast development of Smart Grid. This book is an important addition to the literature and will enhance significant advancement in research. It is a good reference book for researchers in power transformer protection research and a good text book for graduate and undergraduate students in electrical engineering.

Chapter headings include: Transformer differential protection principle and existing problem analysis; Malfunction mechanism analysis due to nonlinearity of transformer core; Novel analysis tools on operating characteristics of Transformer differential protection; Novel magnetizing inrush identification schemes; Comprehensive countermeasures on improving the performance of transformer differential protection

- An advanced level examination of the latest developments in power transformer protection
- Presents a new and systematic view of power transformer protection, enabling readers to design new models and consider fresher design approaches
• Offers a set of approaches to optimize the power system from a microeconomic point of view

ABOUT THE AUTHOR

**Xiangning Lin**, Professor, College of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China.

Prof. Lin was the first to discover the ultra-saturation phenomenon of power transformer and he designed operating characteristics analysis planes to make clear the advantages and disadvantages of existing differential protection of power transformer. He invented a variety of novel protection algorithms for the main protection of the power transformer. A series of papers were published in journals including IEEE Transactions on Power Systems and IEEE Transactions on Power Delivery. The work has been widely acknowledged and cited by international peers. He also pioneers the introduction of modern signal processing techniques to design the protection criteria for power transformer. He was the winner of the 2nd Class National Natural Science Award in 2009. He has published nearly 200 papers and books (in Chinese), he also owns over 15 patents.

**Jing Ma**, Associate Professor, School of Electrical and Electronic Engineering, North China Electric Power University, Beijing, China.

Prof. Ma was the first to apply the two-terminal network algorithm to the areas of power system protection. The work has been widely acknowledged and cited by international peers. He also proposed an approach based on grille fractal to solve the TA saturation problem, and the related paper has been published in the IEEE Transactions on Power Delivery. The research results were used in many practical engineering projects.

**Dr. Qing Tian**, Senior Engineer with the Maintenance and Test Center of EHV Transmission Co. Ltd, Southern Power Grid, Guangzhou, China.

**Dr. Hanli Weng**, Senior Engineer with Three-Gorge Hydropower Plant, China Yangtze Power Co., Ltd.

Both have been working in this area since 1995. Their main research fields include power system operation analysis and control, voltage and reactive power optimization, power system reliability and risk assessment and power system energy saving assessment and planning.