

Preface

Transformer engineering is one of the earliest sciences within the field of electric power engineering, and power is the earliest discipline within the field of electrical engineering. To some, this means that transformer technology is a fully mature and staid industry, with little opportunity for innovation or ingenuity by those practicing in the field.

Of course, we in the industry find that premise to be erroneous. One need only scan the technical literature to recognize that leading-edge suppliers, users, and academics involved with power transformers are continually reporting novelties and advancements that would have been totally insensible to engineers of even the recent past. I contend that there are three basic levels of understanding, any of which may be appropriate for persons engaged with transformers in the electric power industry. Depending on day-to-day involvement, the individual's posture in the field can be described as:

- Curious — those with only peripheral involvement with transformers, or a nonprofessional lacking relevant academic background or any particular need to delve into the intricacies of the science
- Professional — an engineer or senior-level technical person who has made a career around electric power transformers, probably including other heavy electric-power apparatus and the associated power-system transmission and distribution operations
- Expert — those highly trained in the field (either practically or analytically) to the extent that they are recognized in the industry as experts. These are the people who are studying and publishing the innovations that continue to prove that the field is nowhere near reaching a technological culmination.

So, to whom is this book directed? It will truly be of use to any of those described in the previous three categories.

The *curious* person will find the material needed to advance toward the level of professional. This reader can use the book to obtain a deeper understanding of many topics.

The *professional*, deeply involved with the overall subject matter of this book, may smugly grin with the self-satisfying attitude of, "I know all that!" This person, like myself, must recognize that there are many transformer topics. There is always room to learn. We believe that this book can also be a valuable resource to professionals.

The *expert* may be so immersed in one or a few very narrow specialties within the field that he also may benefit greatly from the knowledge imparted in the peripheral specialties.

The book is divided into three fundamental groupings: The first stand-alone chapter is devoted to *Theory and Principles*. The second chapter, *Equipment Types*, contains nine sections that individually treat major transformer types. The third chapter, which contains 14 sections, addresses *Ancillary Topics* associated with power transformers. Anyone with an interest in transformers will find a great deal of useful information.

I wish to recognize the interest of CRC Press and the personnel who have encouraged and supported the preparation of this book. Most notable in this regard are Nora Konopka, Helena Redshaw, and Gail Renard. I also want to acknowledge Professor Leo Grigsby of Auburn University for selecting me to edit the “Transformer” portion of his *The Electric Power Engineering Handbook* (CRC Press, 2001), which forms the basis of this handbook. Indeed, this handbook is derived from that earlier work, with the addition of four wholly new chapters and the very significant expansion and updating of much of the other earlier work. But most of all, appreciation is extended to each writer of the 24 sections that comprise this handbook. The authors’ diligence, devotion, and expertise will be evident to the reader.

James H. Harlow
Editor