

# PREFACE

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The application of power system risk assessment has drawn ever-increasing interest in the electric utility industry, particularly since massive power outage events happened across the world in recent years. In essence, power systems behave probabilistically and system risk cannot be avoided fully. However, system risk can be evaluated and managed to an acceptable level in planning, design, operation, and maintenance activities.

This book originated from my deep involvement in this area, including development of models and methods and their actual applications. My previous employer, BC Hydro, and current company, British Columbia Transmission Corporation, have always provided me an encouraging atmosphere to carry on many projects for more than 10 years. Practical engineering problems and the deregulation process in the power market have created new challenges in system risk analysis. This enabled me to produce a considerable number of technical reports and papers that formed the foundation of the book. The experience from my academic career to the industrial environment made me recognize that a gap exists between power system risk theory and actual applications in utilities. The intent of this book is to fill that gap. The difficulties faced by practicing engineers include how to determine the component outage models that really reflect reality, how to deal with the uncertainty in statistical data, how to select the appropriate risk evaluation method for a specific case and, particularly, how to apply fundamentals and methodologies to each individual engineering issue.

Graduates who lack an understanding of real utility systems often find themselves at a loss regarding an industrial subject, even if they may have good knowledge in the risk theory and basic mathematics. This book has been structured to respond to these concerns. The primary emphasis is placed on the various application topics, although some new models and concepts have been also presented. The majority of examples that demonstrate the applications are based on actual projects that have been performed. This should be the most distinguishing feature of the book. It is my belief that the book will serve both engineers and advanced students who are or will be dedicated to power system risk assessment and management.

