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Nota di contenuto	Switching in Electrical Transmission and Distribution Systems; Contents; Preface; 1 Switching in Power Systems; 1.1 Introduction; 1.2 Organization of this Book; 1.3 Power-System Analysis; 1.4 Purpose of Switching; 1.4.1 Isolation and Earthing; 1.4.2 Busbar-Transfer Switching; 1.4.3 Load Switching; 1.4.4 Fault-Current Interruption; 1.5 The Switching Arc; 1.6 Transient Recovery Voltage (TRV); 1.6.1 TRV Description; 1.6.2 TRV Composed of Load- and Source-Side Contributions; 1.7 Switching Devices; 1.8 Classification of Circuit-Breakers; References; 2 Faults in Power Systems; 2.1 Introduction 2.2 Asymmetrical Current 2.2.1 General Terms; 2.2.2 DC Time Constant; 2.2.3 Asymmetrical Current in Three-Phase Systems; 2.3 Short-Circuit Current Impact on System and Components; 2.4 Fault Statistics; 2.4.1 Occurrence and Nature of Short-Circuits; 2.4.2 Magnitude of Short-Circuit Current; References; 3 Fault-Current Breaking and Making; 3.1 Introduction; 3.2 Fault-Current Interruption; 3.3 Terminal Faults; 3.3.1 Introduction; 3.3.2 Three-Phase Current Interruption; 3.4 Transformer-Limited Faults; 3.4.1 Transformer Modelling for TRV Calculation; 3.4.2 External Capacitances

3.5 Reactor-Limited Faults 3.6 Faults on Overhead Lines; 3.6.1 Short-Line Faults; 3.6.2 Long-Line Faults; 3.7 Out-of-Phase Switching; 3.7.1 Introduction; 3.7.2 Switching between Generator and System; 3.7.3 Switching between Two Systems; 3.8 Fault-Current Making; 3.8.1 Impact of Making a Short-Circuit Current on the Circuit-Breaker; 3.8.2 Switching-Voltage Transients at Making in Three-Phase Systems; References; 4 Load Switching; 4.1 Normal-Load Switching; 4.2 Capacitive-Load Switching; 4.2.1 Introduction; 4.2.2 Single-Phase Capacitive-Load Switching; 4.2.3 Three-Phase Capacitive-Load Switching 4.2.4 Late Breakdown Phenomena 4.2.5 Overhead-Line Switching; 4.2.6 Capacitor-Bank Energization; 4.3 Inductive-Load Switching; 4.3.1 Current Chopping; 4.3.2 Implication of Current Chopping; 4.3.3 Inductive-Load Switching Duties; References; 5 Calculation of Switching Transients; 5.1 Analytical Calculation; 5.1.1 Introduction; 5.1.2 Switching LR Circuits; 5.1.3 Switching RLC Circuits; 5.2 Numerical Simulation of Transients; 5.2.1 Historical Overview; 5.2.2 The Electromagnetic Transients Program; 5.2.3 Overview of Electrical Programs for Transient Simulation 5.3 Representation of Network Elements when Calculating TransientsReferences; 6 Current Interruption in Gaseous Media; 6.1 Introduction; 6.2 Air as an Interrupting Medium; 6.2.1 General; 6.2.2 Fault-Current Interruption by Arc Elongation; 6.2.3 Arc Chutes; 6.2.4 Arcs in Open Air; 6.2.5 Current Interruption by Compressed Air; 6.3 Oil as an Interrupting Medium; 6.3.1 Introduction; 6.3.2 Current Interruption in Bulk-Oil Circuit-Breakers; 6.3.3 Current Interruption in Minimum-Oil Circuit-Breakers; 6.4 Sulfur Hexafluoride (SF<sub>6</sub>) as an Interrupting Medium; 6.4.1 Introduction 6.4.2 Physical Properties

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Sommario/riassunto

This book covers the technology of switching in systems for electrical power transmission and distribution, from medium to (and including) ultra-high voltage for alternating current (AC). Emphasis is on the electrical aspects, covering the electrical transient phenomena of switching, its background, a generic description of equipment used for switching, various application examples, specification and commissioning of such equipment and testing aspects. The different methods to test high-voltage circuit-breakers are presented for each type of switching condition. In order to be close to the use

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