

1. Record Nr.	UNISA996395416303316
Autore	Russell John, physician
Titolo	Removed from Smithfield to Leather-Lane in Holborn, by the Hole in the Wall, the corner house against Baldwin's-Garden, near Hatton-Garden, J. Russell, oculist, professor of physick and surgery,&c [[electronic resource]]
Pubbl/distr/stampa	[London, : s.n., 1680]
Descrizione fisica	1 sheet ([1] p.)
Soggetti	Advertising - Medicine Physicians - England Broadside17th century.England
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Imprint from Wing. At end: Drawing teeth with a touch. Reproduction of original in the British Library.
Sommario/riassunto	eebo-0018

2. Record Nr.	UNINA9910829869303321
Autore	Das J. C. <1934->
Titolo	Power system harmonics and passive filter designs / / J.C. Das
Pubbl/distr/stampa	Hoboken, New Jersey : , : IEEE Press/Wiley, , [2015] [Piscataway, New Jersey] : , : IEEE Xplore, , [2015]
ISBN	1-118-88705-0 1-119-03572-4
Descrizione fisica	1 online resource (873 p.)
Collana	IEEE press series on power engineering
Disciplina	621.319/1 621.3191
Soggetti	Electric power system stability Harmonics (Electric waves) Electric filters, Passive
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	FOREWORD xv -- PREFACE xix -- ABOUT THE AUTHOR xxi -- CHAPTER 1 POWER SYSTEM HARMONICS 1 -- 1.1 Nonlinear Loads 2 -- 1.2 Increases in Nonlinear Loads 3 -- 1.3 Effects of Harmonics 4 -- 1.4 Distorted Waveforms 4 -- 1.5 Harmonics and Sequence Components 7 -- 1.6 Harmonic Indices 9 -- 1.7 Power Factor, Distortion Factor, and Total Power Factor 11 -- 1.8 Power Theories 13 -- 1.9 Amplification and Attenuation of Harmonics 27 -- References 28 -- CHAPTER 2 FOURIER ANALYSIS 31 -- 2.1 Periodic Functions 31 -- 2.2 Orthogonal Functions 31 -- 2.3 Fourier Series and Coefficients 33 -- 2.4 Odd Symmetry 35 -- 2.5 Even Symmetry 36 -- 2.6 Half-Wave Symmetry 37 -- 2.7 Harmonic Spectrum 41 -- 2.8 Complex form of Fourier Series 41 -- 2.9 Fourier Transform 43 -- 2.10 Dirichlet Conditions 52 -- 2.11 Power Spectrum of a Function 54 -- 2.12 Convolution 56 -- 2.13 Sampled Waveform: Discrete Fourier Transform 57 -- 2.14 Fast Fourier Transform 64 -- References 69 -- CHAPTER 3 HARMONIC GENERATION-1 71 -- 3.1 Harmonics in Transformers 71 -- 3.2 Energization of a Transformer 79 -- 3.3 Delta Windings of Three-Phase Transformers 82 -- 3.4 Harmonics in Rotating Machine Windings 92 -- 3.5 Cogging and Crawling of Induction Motors 97 -- 3.6 Synchronous

Generators 102 -- 3.7 Saturation of Current Transformers 104 -- 3.8 Ferroresonance 105 -- 3.9 Power Capacitors 111 -- 3.10 Transmission Lines 112 -- References 112 -- CHAPTER 4 HARMONIC GENERATION-II 115 -- 4.1 Static Power Converters 115 -- 4.2 Single-Phase Bridge Circuit 115 -- 4.3 Reactive Power Requirements of Converters 122 -- 4.4 Three-Phase Bridge Circuit 124 -- 4.5 Harmonics on Output (DC) Side 133 -- 4.6 Inverter Operation 135 -- 4.7 Diode Bridge Converters 139 -- 4.8 Switch-Mode Power (SMP) Supplies 142 -- 4.9 Home Appliances 143 -- 4.10 Arc Furnaces 144 -- 4.11 Cycloconverters 147 -- 4.12 Thyristor-Controlled Reactor 150 -- 4.13 Pulse Width Modulation 154 -- 4.14 Voltage Source Converters 158 -- 4.15 Wind Power Generation 162 -- 4.16 Fluorescent Lighting 165. 4.17 Adjustable Speed Drives 167 -- 4.18 Pulse Burst Modulation 174 -- 4.19 Chopper Circuits and Electric Traction 175 -- 4.20 Slip Frequency Recovery Schemes 177 -- 4.21 Power Semiconductor Devices 178 -- References 181 -- CHAPTER 5 INTERHARMONICS AND FLICKER 183 -- 5.1 Interharmonics 183 -- 5.2 Sources of Interharmonics 183 -- 5.3 Arc Furnaces 192 -- 5.4 Effects of Interharmonics 196 -- 5.5 Reduction of Interharmonics 198 -- 5.6 Flicker 198 -- 5.7 Flicker Testing 202 -- 5.8 Control of Flicker 205 -- 5.9 Tracing Methods of Flicker and Interharmonics 208 -- 5.10 Torsional Analysis 210 -- 5.11 Subsynchronous Resonance 217 -- References 225 -- CHAPTER 6 HARMONIC REDUCTION AT THE SOURCE 229 -- 6.1 Phase Multiplication 230 -- 6.2 Varying Topologies 230 -- 6.3 Harmonic Cancellation: Commercial Loads 232 -- 6.4 Input Reactors to the PWM ASDs 235 -- 6.5 Active Filters 237 -- 6.6 Active Current Shaping 248 -- 6.7 Hybrid Connections of Active and Passive Filters 251 -- 6.8 Impedance Source Inverters 255 -- 6.9 Matrix Converters 259 -- 6.10 Multilevel Inverters 262 -- 6.11 Switching Algorithms for Harmonic Control 270 -- 6.12 Theory of Resultants of Polynomials 271 -- References 277 -- CHAPTER 7 ESTIMATION AND MEASUREMENTS OF HARMONICS 281 -- 7.1 Waveform without Ripple Content 282 -- 7.2 Waveform with Ripple Content 288 -- 7.3 Phase Angle of Harmonics 298 -- 7.4 Measurements of Harmonics 304 -- 7.5 Measuring Equipment 309 -- 7.6 Transducers for Harmonic Measurements 312 -- 7.7 Characterizing Measured Data 314 -- 7.8 Probabilistic Concepts 316 -- 7.9 Summation of Harmonic Vectors with Random Angles 323 -- 7.10 Central Limit Theorem 326 -- 7.11 Kalman Filtering 326 -- References 329 -- CHAPTER 8 EFFECTS OF HARMONICS 331 -- 8.1 Rotating Machines 332 -- 8.2 Effect of Negative Sequence Currents on Synchronous Generators 335 -- 8.3 Insulation Stresses 337 -- 8.4 Transformers 345 -- 8.5 Cables 359 -- 8.6 Capacitors 361 -- 8.7 Voltage Notching 362 -- 8.8 EMI (Electromagnetic Interference) 363. 8.9 Overloading of Neutral 367 -- 8.10 Protective Relays and Meters 369 -- 8.11 Circuit Breakers and Fuses 372 -- 8.12 Telephone Influence Factor 372 -- References 377 -- CHAPTER 9 HARMONIC RESONANCE 379 -- 9.1 Two-Port Networks 379 -- 9.2 Resonance in Series and Parallel RLC Circuits 383 -- 9.3 Practical LC Tank Circuit 391 -- 9.4 Reactance Curves 396 -- 9.5 Foster's Networks 397 -- 9.6 Harmonic Resonance 400 -- 9.7 Harmonic Resonance in a Distribution System 404 -- 9.8 Elusiveness of Resonance Problems 405 -- 9.9 Resonance Due to Single-Tuned Filters 408 -- 9.10 Switched Capacitors for Power Factor Improvement 410 -- 9.11 Secondary Resonance 411 -- 9.12 Multiple Resonances in a Distribution Feeder 415 -- 9.13 Part-Winding Resonance in Transformer Windings 416 -- 9.14 Composite Resonance 419 -- 9.15 Resonance in Transmission Lines 421 -- 9.16 Zero Sequence Resonance 421 -- 9.17 Factors

Affecting Harmonic Resonance 423 -- References 424 -- CHAPTER 10 HARMONIC DISTORTION LIMITS ACCORDING TO STANDARDS 427 -- 10.1 Standards for Limitation of Harmonics 427 -- 10.2 IEEE 519 Harmonic Current and Voltage Limits 429 -- 10.3 Point of Common Coupling (PCC) 432 -- 10.4 Applying IEEE 519 Harmonic Distortion Limits 433 -- 10.5 Time Varying Characteristics of Harmonics 435 -- 10.6 IEC Harmonic Current Emission Limits 436 -- 10.7 Voltage Quality 440 -- 10.8 Commutation Notches 444 -- 10.9 Applying Limits to Practical Power Systems 449 -- References 450 -- CHAPTER 11 APPLICATION OF SHUNT CAPACITOR BANKS 453 -- 11.1 Shunt Capacitor Banks 453 -- 11.2 Location of Shunt Capacitors 458 -- 11.3 Ratings of Capacitors 459 -- 11.4 Shunt Capacitor Bank Arrangements 465 -- 11.5 Fusing 468 -- 11.6 Connections of Banks 476 -- 11.7 Unbalance Detection 479 -- 11.8 Destabilizing Effect of Capacitor Banks 481 -- 11.9 Switching Transients of Capacitor Banks 483 -- 11.10 Control of Switching Transients 486 -- 11.11 Switching Capacitors with Motors 489 -- 11.12 Switching Devices 490 -- 11.13 Switching Controls 498. References 501 -- CHAPTER 12 MODELING OF SYSTEM COMPONENTS FOR HARMONIC ANALYSIS 503 -- 12.1 Transmission Lines 503 -- 12.2 Cables 532 -- 12.3 Zero Sequence Impedance of OH Lines and Cables 538 -- 12.4 Filter Reactors 539 -- 12.5 Transformers 540 -- 12.6 Induction Motors 554 -- 12.7 Synchronous Generators 556 -- 12.8 Load Models 557 -- 12.9 System Impedance 559 -- 12.10 Three-Phase Models 561 -- 12.11 Uncharacteristic Harmonics 563 -- 12.12 Converters 564 -- References 566 -- CHAPTER 13 HARMONIC MODELING OF SYSTEMS 569 -- 13.1 Electrical Power Systems 569 -- 13.2 Extent of Network Modeling 572 -- 13.3 Impact of Loads and Generation 573 -- 13.4 Short-Circuit and Fundamental Frequency Load Flow Calculations 574 -- 13.5 Industrial Systems 578 -- 13.6 Distribution Systems 582 -- 13.7 Transmission Systems 589 -- 13.8 Compensation of Transmission Lines 593 -- 13.9 Commercial Buildings 598 -- 13.10 Residential Loads 599 -- 13.11 HVDC Transmission 599 -- References 605 -- CHAPTER 14 HARMONIC PROPAGATION 607 -- 14.1 Harmonic Analysis Methods 608 -- 14.2 Frequency Domain Analysis 608 -- 14.3 Frequency Scan 610 -- 14.4 Voltage Scan 611 -- 14.5 Harmonic Analysis Methods 612 -- 14.6 Time Domain Analysis 620 -- 14.7 Sensitivity Methods 620 -- 14.8 Unbalanced AC System and HVDC Link 622 -- 14.9 Hybrid Frequency and Time Domain Concept 623 -- 14.10 Probabilistic Concepts 626 -- 14.11 Computer-Based Programs 631 -- 14.12 Harmonic Analyses of a Large Industrial System 632 -- 14.13 Long Transmission Line 653 -- 14.14 34.5 kV UG Cable 673 -- 14.15 5-Bus Transmission System 673 -- References 682 -- CHAPTER 15 PASSIVE FILTERS 685 -- 15.1 Filter Types 685 -- 15.2 Single-Tuned Filters 690 -- 15.3 Harmonic Filter Detuning and Unbalance 699 -- 15.4 Relations in an ST Filter 699 -- 15.5 Selection of Q Factor 701 -- 15.6 Double-Tuned Filter 702 -- 15.7 Bandpass Filters 704 -- 15.8 Damped Filters 705 -- 15.9 Type C Filter 710 -- 15.10 Zero Sequence Traps 716 -- 15.11 Series-Type Low-Pass Filter 717. 15.12 Transfer Function Approach for Filter Designs 718 -- 15.13 Optimization Techniques of Filter Designs 723 -- 15.14 Genetic Algorithms for Filter Designs 728 -- 15.15 HVDC-DC Filters 731 -- 15.16 Limitations of Passive Filters 734 -- 15.17 Flowchart for Design of Filters 735 -- 15.18 Filter Components 735 -- 15.19 Failure of Harmonic Filters 741 -- References 741 -- CHAPTER 16 PRACTICAL PASSIVE FILTER DESIGNS 745 -- 16.1 Study 1: Small Distribution System with Major Six-Pulse Loads 745 -- 16.2 Study 2: Filters for Arc

Furnance Loads 756 -- 16.3 Study 3: Filters for Two 8000-Hp ID Fan Drives 770 -- 16.4 Study 4: Double-Tuned filter on a Three-Winding Transformer 782 -- 16.5 Study 5: PV Solar Generation Plant 785 -- 16.6 Study 6: Impact of Harmonics at a Distance 799 -- 16.7 Study 7: Wind Generation Farm 804 -- INDEX 829.

Sommario/riassunto

"Many books on Power System Harmonics only cover certain aspects of the subject. This book is the first to cover Power System Harmonics in depth, including real world case studies engineers can learn from. Written by a well-known author with extensive experience designing harmonic filters, this book is written in a thorough and easy to read way, making it an invaluable resource for practicing engineers as well as students. Coverage includes new harmonic mitigation technologies, detailed step-by-step design of passive filters, interharmonics and flicker, and more. Readers who are new to the field will find this book easy to understand and will be able to grasp the subject easily through the many examples, case studies and illustrations. Readers who are already familiar with Power System Harmonics will be able to learn new insights and the latest developments"--
