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Autore	Ahmad Mukhtar <1948->
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Nota di contenuto	Preface; 1Energy Management Systems; 1.1 Real-Time Control of a Power System; 1.2 Energy Control Center; 1.3 Security Analysis and Monitoring; 1.4 State Estimation; References; 2Power Flow Equations; 2.1 Power System Representation; 2.1.1 Transmission Lines; 2.1.2 Power Transformer; 2.2 Admittance Diagram; 2.3 Power Flow Analysis; 2.3.1 Gauss-Seidel Method; 2.3.2 Newton-Raphson Method; 2.4 Decoupled Power Flow; 2.5 Visual Tools for Power Flow Studies; 2.6 DC Power Flow; 2.7 Regulating Transformers; References; 3Weighted Least Square Estimation; 3.1 Introduction. 3.2 Properties of Weighted Least Square3.3 Maximum Likelihood Weighted Least Square State Estimation; 3.3.1 Likelihood Function; 3.4 Matrix Formulation and Measurement Measurement Model; 3.4.1 Measurement Model; 3.5 WLS State Estimation Algorithm; 3.5.1 State Estimation by Orthogonal Decomposition; 3.5.2 Equality Constrained State Estimation; 3.6 Decoupled State Estimation Method; 3.6.1 Algorithm Decoupling; 3.6.2 Model Decoupling; 3.7 DC State Estimator; References; 4Network Observability and Pseudomeasurem; 4.1 Network Graphs and Matrices; 4.2 Bus Admittance and Bus Impedance Matrices. 4.2.1 Loop to Branch Incidence Matrix4.3 Loop Equations; 4.4 Observability Analysis; 4.5 Branch Variable Formulation; 4.5.1 New Branch Variables; 4.5.2 Measurement Model Using Branch Variables;

4.5.3 Observability Analysis for Branch Variable Formulation; 4.6 Network Topology Processing; 4.7 Network Configuration; 4.7.1 Topological Observability; 4.7.2 Topological Observability Algorithm; 4.8 Topology Error Processing; 4.9 Detection and Identification of Topology Errors; 4.9.1 Residual Analysis; References; 5 Bad Data Detection; 5.1 Bad Data Detection in WLS Method; 5.1.1 Leverage Points. 5.2 Methods of Bad Data Detection 5.2.1 Chi-Squares Test; 5.3 Identification of Bad Data; 5.3.1 Method of Normalized Residual; 5.3.2 Normalized Residuals; 5.3.3 Largest Normalized Residual Test; 5.4 Hypothesis Testing Identification; 5.5 Case Study: Improved Bad Data Processing with Strategic Placement of PMUs; References; Appendix 5A: Chi-Square Test; 6 Robust State Estimation; 6.1 Basic Formulation; 6.2 Breakdown Points; 6.2.1 Leverage Points; 6.3 M-Estimators; 6.4 State Estimation Methods with Bad Data Rejection Properties; 6.4.1 Methods Using Nonquadratic Objective Functions. 6.5 Least Absolute Value State Estimator 6.6 Simplex Method; 6.7 Interior Point Algorithm; 6.8 LMS Estimator; References; Appendix 6A: Linear Programming; 6A.1 Simplex Algorithm; 7 State Estimation Using Line Current Measurements; 7.1 Introduction; 7.2 Modeling State Equations; 7.3 State Estimation with Current Measurements; 7.3.1 Multiple Solutions; 7.4 Methods to Obtain a Unique Solution; 7.5 Determining the Uniqueness of a Solution Based on Numerical Methods; 7.6 Bad Data Detection in the Presence of Current Measurements; 7.6.1 WLS State Estimation; 7.6.2 WLAV Estimation.

Sommario/riassunto

State estimation is one of the most important functions in power system operation and control. This area is concerned with the overall monitoring, control, and contingency evaluation of power systems. It is mainly aimed at providing a reliable estimate of system voltages. State estimator information flows to control centers, where critical decisions are made concerning power system design and operations. This valuable resource provides thorough coverage of this area, helping professionals overcome challenges involving system quality, reliability, security, stability, and economy. Engineers are.
