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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 Algorith; 4.8 Topology Error Processing; 4.9 Detection and Identification of Topology Errors; 4.9.1 Residual Analysis; References; 5Bad Data Detection; 5.1 Bad Data Detection in WLS Method; 5.1.1 Leverage Points.
5.2 Methods of Bad Data Detection5.2.1 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; 6Robust 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 Estimator6.6 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.