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Titolo	Dynamic vulnerability assessment and intelligent control for sustainable power systems / / edited by Professor Jose L. Rueda Torres, Professor Francisco Gonzalez-Longatt
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Soggetti	Electric power distribution - Testing Smart power grids
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	The role of wide area monitoring systems in dynamic vulnerability assessment -- Steady state security -- Probabilistic indicators for the assessment of reliability and security of future power systems -- An enhanced WAMS-based power system oscillation analysis approach -- Pattern-recognition-based approach for dynamic vulnerability status prediction -- Performance-indicator-based real-time vulnerability assessment -- Challenges ahead risk-based AC optimal power flow under uncertainty for smart, sustainable power systems -- Modelling preventive and corrective actions using linear formulations -- Model-based predictive control for damping electromechanical oscillations in power systems -- Voltage stability enhancement by computational intelligence methods -- Knowledge-based primary and optimization-based secondary control of multi-terminal HVDC grids -- Model based voltage/reactive control in sustainable distribution systems -- Multi-agent-based approach for intelligent control of reactive power injection in transmission systems -- Operation of distribution systems within secure limits using real-time model predictive control -- Enhancement of transmission system voltage stability through local control of distribution networks -- Electric power network splitting considering

frequency dynamics and transmission overloads constraints -- High-speed transmission line protection based on empirical orthogonal functions -- Implementation of a real phasor based vulnerability assessment and control scheme : the Ecuadorian wampac system.

Sommario/riassunto

Identifying, assessing, and mitigating electric power grid vulnerabilities is a growing focus in short-term operational planning of power systems. Through illustrated application, this important guide surveys state-of-the-art methodologies for the assessment and enhancement of power system security in short term operational planning and real-time operation. The methodologies employ advanced methods from probabilistic theory, data mining, artificial intelligence, and optimization, to provide knowledge-based support for monitoring, control (preventive and corrective), and decision making tasks. Key features: Introduces behavioural recognition in wide-area monitoring and security constrained optimal power flow for intelligent control and protection and optimal grid management. Provides in-depth understanding of risk-based reliability and security assessment, dynamic vulnerability assessment methods, supported by the underpinning mathematics. Develops expertise in mitigation techniques using intelligent protection and control, controlled islanding, model predictive control, multi-agent and distributed control systems Illustrates implementation in smart grid and self-healing applications with examples and real-world experience from the WAMPAC (Wide Area Monitoring Protection and Control) scheme. Dynamic Vulnerability Assessment and Intelligent Control for Power Systems is a valuable reference for postgraduate students and researchers in power system stability as well as practicing engineers working in power system dynamics, control, and network operation and planning.