

# Contents

---

Preface.....	ix
Editor .....	xi
Contributors .....	xiii

## PART I Power System Protection

---

<i>Miroslav M. Begovic</i> .....	I-1
1 Transformer Protection .....	1-1
<i>Alexander Apostolov, John Appleyard, Ahmed Elnewehi, Robert Haas,     and Glenn W. Swift</i>	
2 The Protection of Synchronous Generators .....	2-1
<i>Gabriel Benmouyal</i>	
3 Transmission Line Protection.....	3-1
<i>Stanley H. Horowitz</i>	
4 System Protection.....	4-1
<i>Miroslav M. Begovic</i>	
5 Digital Relaying.....	5-1
<i>James S. Thorp</i>	
6 Use of Oscillograph Records to Analyze System Performance.....	6-1
<i>John R. Boyle</i>	
7 Systems Aspects of Large Blackouts .....	7-1
<i>Ian Dobson</i>	

## PART II Power System Dynamics and Stability

---

<i>Prabha S. Kundur</i> .....	II-1
8 Power System Stability .....	8-1
<i>Prabha S. Kundur</i>	

<b>9</b>	Transient Stability .....	<b>9-1</b>
	<i>Kip Morison</i>	
<b>10</b>	Small-Signal Stability and Power System Oscillations .....	<b>10-1</b>
	<i>John Paserba, Juan Sanchez-Gasca, Lei Wang, Prabha S. Kundur, Einar Larsen, and Charles Concordia</i>	
<b>11</b>	Voltage Stability .....	<b>11-1</b>
	<i>Yakout Mansour and Claudio Cañizares</i>	
<b>12</b>	Direct Stability Methods .....	<b>12-1</b>
	<i>Vijay Vittal</i>	
<b>13</b>	Power System Stability Controls .....	<b>13-1</b>
	<i>Carson W. Taylor</i>	
<b>14</b>	Power System Dynamic Modeling .....	<b>14-1</b>
	<i>William W. Price and Juan Sanchez-Gasca</i>	
<b>15</b>	Wide-Area Monitoring and Situational Awareness .....	<b>15-1</b>
	<i>Manu Parashar, Jay C. Giri, Reynaldo Nuqui, Dmitry Kosterev, R. Matthew Gardner, Mark Adamiak, Dan Trudnowski, Aranya Chakrabortty, Rui Menezes de Moraes, Vahid Madani, Jeff Dagle, Walter Sattinger, Damir Novosel, Mevludin Glavic, Yi Hu, Ian Dobson, Arun Phadke, and James S. Thorp</i>	
<b>16</b>	Assessment of Power System Stability and Dynamic Security Performance .....	<b>16-1</b>
	<i>Lei Wang and Pouyan Pourbeik</i>	
<b>17</b>	Power System Dynamic Interaction with Turbine Generators .....	<b>17-1</b>
	<i>Bajarang L. Agrawal, Donald G. Ramey, and Richard G. Farmer</i>	
<b>18</b>	Wind Power Integration in Power Systems .....	<b>18-1</b>
	<i>Reza Iravani</i>	
<b>19</b>	Flexible AC Transmission Systems (FACTS) .....	<b>19-1</b>
	<i>Rajiv K. Varma and John Paserba</i>	

### PART III Power System Operation and Control

---

<i>Bruce F. Wollenberg</i> .....	<b>III-1</b>	
<b>20</b>	Energy Management .....	<b>20-1</b>
	<i>Neil K. Stanton, Jay C. Giri, and Anjan Bose</i>	
<b>21</b>	Generation Control: Economic Dispatch and Unit Commitment .....	<b>21-1</b>
	<i>Charles W. Richter Jr.</i>	
<b>22</b>	State Estimation .....	<b>22-1</b>
	<i>Jason G. Lindquist and Danny Julian</i>	

<b>23</b>	Optimal Power Flow.....	<b>23-1</b>
	<i>Mohamed E. El-Hawary</i>	
<b>24</b>	Security Analysis.....	<b>24-1</b>
	<i>Nouredine Hadjsaid</i>	
<b>Index</b> .....		<b>Index-1</b>