Table of Contents		Market Structure	20
Tuble of contents		Supply	20
		Demand	22
		Market Concentration	23
Preface	i	Local Market Structure and Offer Capping	25
		Local Market Structure	25
SECTION 1 Introduction	1	Ownership of Marginal Resources	27
Q2 2012 In Review	1	Type of Marginal Resources	28
PJM Market Background	2	Frequently Mitigated Units and Associated Units	28
Conclusions	3	Market Performance: Load and LMP	30
Role of MMU	6	Load	30
Reporting	6	Locational Marginal Price (LMP)	39
Monitoring	7	Load and Spot Market	53
Market Design	8	CECTION 2 Or out the a December	F 7
Recommendations	8	SECTION 3 Operating Reserve	57
Highlights	9	Highlights	57
Section 2, Energy Market	9	Conclusion	57
Section 3, Operating Reserve	10	Operating Reserve Credits and Charges	58
Section 4, Capacity	10	Credit and Charge Categories	58
Section 5, Demand Response	11	Operating Reserve Results	59
Section 6, Net Revenue	11	Operating Reserve Charges	59
Section 7, Environmental and Renewables	11	Operating Reserve Rates	62
Section 8, Interchange Transactions	12	Deviations	65
Section 9, Ancillary Services	12	Operating Reserve Credits by Category	66
Section 10, Congestion and Marginal Losses	13	Characteristics of Credits	66
Section 11, Planning	13	Types of Units	66
Section 12, Financial Transmission Rights and Auction		Economic and Noneconomic Generation	68
Revenue Rights	14	Geography of Charges and Credits	68
Total Price of Wholesale Power	14	Load Response Resource Operating Reserve Credits	71
Components of Total Price	14	Reactive Service	71
		Operating Reserve Issues	72
SECTION 2 Energy Market	17	Concentration of Operating Reserve Credits	72
Highlights	17	Lost Opportunity Cost Credits	74
Conclusion	19	Con-Ed – PSEG Wheeling Contracts Support	78

Black Start and Voltage Support Units	78	SECTION 7 Environmental and Renewable Energy	
Up-to Congestion Transactions	78	Regulations	119
Reactive Service Credits and Operating Reserve Credits	79	Highlights	119
SECTION 4 Capacity Market	80	Conclusion	119
		Environmental Regulation	119
Highlights	80	Federal Environmental Regulation of Greenhouse Gas Emissions	119
Conclusion	81	Federal Environmental Regulation of Reciprocating Internal	
Installed Capacity	84	Combustion Engines (RICE)	121
RPM Capacity Market	84	State Regulation of Greenhouse Gas Emissions	121
Market Structure	84	Renewable Portfolio Standards	122
Market Conduct	89	Emissions Controlled Capacity and Renewables in PJM Markets	126
Market Performance	90	Emission Controlled Capacity in the PJM Region	126
Generator Performance	94	Wind Units	127
Capacity Factor	94	Solar Units	130
Generator Performance Factors	94		
Generator Forced Outage Rates	95	SECTION 8 Interchange Transactions	131
SECTION 5 Demand-Side Response (DSR)	103	Highlights	131
•		Conclusion	131
Highlights	103	Interchange Transaction Activity	132
Conclusions	103	Aggregate Imports and Exports	132
PJM Demand Side Programs	104	Real-Time Interface Imports and Exports	133
Participation in Demand Side Programs	105	Real-Time Interface Pricing Point Imports and Exports	135
Economic Program	105	Day-Ahead Interface Imports and Exports	137
SECTION 6 Net Revenue	115	Day-Ahead Interface Pricing Point Imports and Exports	139
		Operating Agreements with Bordering Areas	148
Highlights	115	Other Agreements/Protocols with Bordering Areas	150
Net Revenue	115	Interchange Transaction Issues	150
Theoretical Energy Market Net Revenue	116	Loop Flows	150
New Entrant Combustion Turbine	117	PJM Transmission Loading Relief Procedures (TLRs)	152
New Entrant Combined Cycle	117	Up-To Congestion	153
New Entrant Coal Plant	118	Interface Pricing Agreements with Individual Balancing Authorities	156
		Willing to Pay Congestion and Not Willing to Pay Congestion	159
		Spot Import	160
		Real-Time Dispatchable Transactions	161

iv Table of Contents © 2012 Monitoring Analytics, LLC

SECTION 9 Ancillary Service Markets	163	Congested Facilities	196
Highlights	165	Congestion by Facility Type and Voltage	196
Ancillary Services costs per MW of load: 2001 - 2012	165	Constraint Duration	200
Conclusion	165	Constraint Costs	202
Regulation Market	166	Congestion-Event Summary for MISO Flowgates	205
Proposed Market Design Changes	166	Congestion-Event Summary for the 500 kV System	207
Market Structure	167	Congestion Costs by Physical and Financial Participants	208
Market Conduct	169	CECTION 11 Congretion and Transmission Planning	200
Market Performance	170	SECTION 11 Generation and Transmission Planning	209
Synchronized Reserve Market	172	Highlights	209
Market Structure	172	Planned Generation and Retirements	209
Market Conduct	176	Planned Generation Additions	209
Market Performance	177	PJM Generation Queues	209
Day Ahead Scheduling Reserve (DASR)	181	Planned Deactivations	215
Market Structure	181	Actual Generation Deactivations in 2012	218
Market Conduct	181	Transmission Planning	218
Market Performance	181	Competitive Grid Development	220
Black Start Service	182	SECTION 12 Financial Transmission and Auction	
SECTION 10 Congestion and Marginal Losses	185	Revenue Rights	221
Highlights	185	Highlights	222
Conclusion	185	Conclusion	222
Locational Marginal Price (LMP)	187	Financial Transmission Rights	222
Components	187	Market Structure	223
Zonal Components	188	Credit Issues	225
Energy Costs	189	Patterns of Ownership	225
Energy Accounting	189	Market Performance	226
Total Energy Costs	190	Auction Revenue Rights	241
Marginal Losses	191	Market Structure	241
Marginal Loss Accounting	191	Market Performance	244
Total Calendar Year Marginal Loss Costs	191		
Congestion	193		
Congestion Accounting	193		
Total Calendar Year Congestion	194		

vi Table of Contents © 2012 Monitoring Analytics, LLC

Figure 2-11 Day-ahead and real-time loads (Average hourly volumes): **Figures** January through June of 2012 (See 2011 SOM, Figure 2-10) 34 Figure 2-12 Difference between day-ahead and real-time loads (Average daily volumes): January 2011 through June 2012 (See SECTION 1 Introduction 2011 SOM, Figure 2-12) 36 Figure 1-1 PJM's footprint and its 19 control zones (See 2011 SOM, Figure 2-13 Day-ahead and real-time generation (Average hourly Figure 1-1) 2 volumes): January through June of 2012 (See 2011 SOM, Figure 2-13) 39 **SECTION 2 Energy Market** Figure 2-14 Difference between day-ahead and real-time generation (Average daily volumes): January 2011 through June 2012 Figure 2-1 Average PJM aggregate supply curves: January through (See 2011 SOM, Figure 2-14) 39 June, 2011 and 2012 (See 2011 SOM, Figure 2-1) 20 Figure 2-15 Average LMP histogram for the PJM Real-Time Energy Figure 2-2 PJM footprint first six months peak loads: 2003 to 2012 Market: January through June, 2011 and 2012 (See 2011 SOM, (See 2011 SOM, Figure 2-2) 23 Figure 2-15) 40 Figure 2-3 PJM peak-load comparison: Wednesday, June 20, 2012, Figure 2-16 PJM real-time, monthly, load-weighted, average LMP: and Wednesday, June 08, 2011 (See 2011 SOM, Figure 2-3) 23 2007 through June of 2012 (See 2011 SOM, Figure 2-16) 42 Figure 2-4 PJM hourly Energy Market HHI: January through June Figure 2-17 Spot average fuel price comparison: 2011 and January 2012 (See 2011 SOM, Figure 2-4) 24 through June 2012 (See 2011 SOM, Figure 2-17) 42 Figure 2-5 Frequently mitigated units and associated units Figure 2-18 Average spot fuel cost of generation of CP, CT, and CC: (By month): February, 2006 through June, 2012 (See 2011 SOM, 2011 and January through June 2012 (New Figure) 43 29 Figure 2-5) Figure 2-19 Price histogram for the PJM Day-Ahead Energy Figure 2-6 Frequently mitigated units and associated units total Market: January through June, 2011 and 2012 (See 2011 SOM, months eligible: February, 2006 through June, 2012 (See 2011 Figure 2-18) 44 SOM, Figure 2-6) 30 Figure 2-20 Day-ahead, monthly, load-weighted, average LMP: Figure 2-7 PJM real-time accounting load histogram: January 2007 through June of 2012 (See 2011 SOM, Figure 2-19) 45 through June for years 2011 and 2012 (See 2011 SOM, Figure 2-7) 31 Figure 2-21 Hourly volume of bid and cleared INC, DEC and Up-to Figure 2-8 PJM real-time monthly average hourly load: 2011 Congestion bids (MW) by month: January, 2005 through June, through June of 2012 (See 2011 SOM, Figure 2-8) 32 2012 (See 2011 SOM, Figure 2-20) 47 Figure 2-9 PJM day-ahead load histogram: January through Figure 2-22 PJM day-ahead aggregate supply curves: 2012 June for years 2011 and 2012 (See 2011 SOM, Figure 2-9) 33 example day (See 2011 SOM, Figure 2-21) 50 Figure 2-10 PJM day-ahead monthly average hourly load: 2011 Figure 2-23 Real-time load-weighted hourly LMP minus day-ahead through June of 2012 (See 2011 SOM, Figure 2-10) 34 load-weighted hourly LMP: January through June, 2012 (See 2011 SOM, Figure 2-22) 52

Figure 2-24 Monthly average of real-time minus day-ahead LMP: January through June, 2012 (See 2011 SOM, Figure 2-23)	53	Figure 4-5 PJM EFORd, XEFORd and EFORp: 2012 (See the 2011 SOM, Figure 4-7)	101
Figure 2-25 PJM system hourly average LMP: January through June, 2012 (See 2011 SOM, Figure 2-24)	53	Figure 4-6 PJM monthly generator performance factors: 2012 (See the 2011 SOM, Table 4-8)	102
SECTION 3 Operating Reserve		SECTION 5 Demand-Side Response (DSR)	
Figure 3-1 Weekly weighted average day-ahead operating reserve rat (\$/MWh): January through June 2011 and 2012 (See 2011 SOM, Figure 3-1)	e 62	Figure 5-1 Demand Response revenue by market: Calendar years 2002 through 2011 and the first six months of 2012 (See the 2011 SOM, Figure 5-1)	105
Figure 3-2 Daily balancing operating reserve reliability rates (\$/MWh January through June 2011 and 2012 (See 2011 SOM, Figure 3-2)		Figure 5-2 Economic Program payments by month: Calendar years 2007 through 2011 and January through June 2012 (See the 201	
Figure 3-3 Daily balancing operating reserve deviation rates (\$/MWh January through June 2011 and 2012 (See 2011 SOM, Figure 3-2)		SOM, Figure 5-2)	108
Figure 3-4 Daily lost opportunity cost and canceled resources rates (\$/MWh): January through June 2011 and 2012 (See 2011 SOM,		SECTION 7 Environmental and Renewable Energy Regulations	
Figure 3-2) Figure 3-5 Monthly regional reliability and deviations credits:	64	Figure 7-1 Spot monthly average emission price comparison: 2011 and January through June 2012 (See 2011 SOM, Figure 7-1)	122
December 2008 through June 2012 (See 2011 SOM, Figure 3-5)	77	Figure 7-2 Average hourly real-time generation of wind units in	
Figure 3-6 Monthly balancing operating reserve categories: January through June 2012 (See 2011 SOM, Figure 3-6)	77	PJM: January through June 2012 (See 2011 SOM, Figure 7-2) Figure 7-3 Average hourly day-ahead generation of wind units in	128
through sume 2012 (See 2011 Solm, Figure 3-0)	,,	PJM: January through June 2012 (See 2011 SOM, Figure 7-3)	129
SECTION 4 Capacity Market		Figure 7-4 Marginal fuel at time of wind generation in PJM:	120
Figure 4-1 History of capacity prices: Calendar year 1999 through 2015 (See the 2011 SOM, Figure 4-1)	94	January through June 2012 (See 2011 SOM, Figure 7-4) Figure 7-5 Average hourly real-time generation of solar units in	130
Figure 4-2 PJM equivalent outage and availability factors: Calendar years 2007 to 2012 (See the 2011 SOM, Table 4-1)	96	PJM: January through June 2012 (See 2011 SOM, Figure 7-5)	130
Figure 4-3 Trends in the PJM equivalent demand forced outage rate		SECTION 8 Interchange Transactions	
(EFORd): January through June, 2007 to 2012 (See the 2011 SOM, Figure 4-3)	96	Figure 8-1 PJM real-time and day-ahead scheduled imports and exports: January through June, 2012 (See 2011 SOM, Figure 8-1)	132
Figure 4-4 PJM January through June 2012 distribution of EFORd data by unit type (See the 2011 SOM, Figure 4-4)	97	Figure 8-2 PJM real-time and day-ahead scheduled import and export transaction volume history: January 1999, through June 2012 (See 2011 SOM, Figure 8-2)	133

viii Table of Contents © 2012 Monitoring Analytics, LLC

143	Figure 8-15 Day-ahead interchange volume vs. average hourly LMP available for Duke and PEC imports: January through June, 2012	
144	Figure 8-16 Day-ahead interchange volume vs. average hourly LMP available for Duke and PEC exports: January through June, 2012	159
146	(See 2011 SOM, Figure 8–16) Figure 8–17 Spot import service utilization: January, 2009 through June, 2012 (See 2011 SOM, Figure 8–17)	159 161
147	· ·	h
148	June of 2010, 2011 and 2012 (See 2011 SOM, Figure 9-1)	168
148	June 2012 (See 2011 SOM, Figure 9-2)	169
149	clearing price, marginal unit opportunity cost and offer price (Dollars per MWh): January through June 2012 (See 2011 SOM,	4.770
152	Figure 9-4 Monthly average regulation demand and price: January	170
154	Figure 9-5 Monthly weighted, average regulation cost and price:	171 171
2	Figure 9-6 Ratio of Eligible Synchronized Reserve to Required Tier 2 for all cleared hours in the Mid-Atlantic Subzone: January through June 2012 (See 2011 SOM, Figure 9-6)	171
156	Figure 9-7 Mid-Atlantic Synchronized Reserve Subzone monthly average synchronized reserve required vs. Tier 2 scheduled MW: January through June 2012 (See 2011 SOM, Figure 9-7)	174
	Figure 9-8 RFC Synchronized Reserve Zone, Mid-Atlantic Subzone daily average hourly synchronized reserve required, Tier 2 MW scheduled, and Tier 1 MW estimated: January through June 2012 (See 2011 SOM, Figure 9-9)	
	143 144 146 147 148 149 152 154 7 156	available for Duke and PEC imports: January through June, 2012 (See 2011 SOM, Figure 8-15) Figure 8-16 Day-ahead interchange volume vs. average hourly LMP available for Duke and PEC exports: January through June, 2012 (See 2011 SOM, Figure 8-16) Figure 8-17 Spot import service utilization: January, 2009 through June, 2012 (See 2011 SOM, Figure 8-17) SECTION 9 Ancillary Service Markets Figure 9-1 PJM Regulation Market HHI distribution: January through June of 2010, 2011 and 2012 (See 2011 SOM, Figure 9-1) Figure 9-2 Off peak and on peak regulation levels: January through June 2012 (See 2011 SOM, Figure 9-2) Figure 9-3 PJM Regulation Market daily weighted average market-clearing price, marginal unit opportunity cost and offer price (Dollars per MWh): January through June 2012 (See 2011 SOM, Figure 9-3) Figure 9-3 Monthly average regulation demand and price: January through June 2012 (See 2011 SOM, Figure 9-4) Figure 9-5 Monthly weighted, average regulation cost and price: January through June 2012 (See 2011 SOM, Figure 9-5) Figure 9-6 Ratio of Eligible Synchronized Reserve to Required Tier 2 for all cleared hours in the Mid-Atlantic Subzone: January through June 2012 (See 2011 SOM, Figure 9-6) Figure 9-7 Mid-Atlantic Synchronized Reserve Subzone monthly average synchronized reserve required vs. Tier 2 scheduled MW: January through June 2012 (See 2011 SOM, Figure 9-7) Figure 9-8 RFC Synchronized Reserve Zone, Mid-Atlantic Subzone daily average hourly synchronized reserve required, Tier 2 MW scheduled, and Tier 1 MW estimated: January through June 2012

Figure 9-9 Tier 2 synchronized reserve average hourly offer volume (MW): January through June 2012 (See 2011 SOM, Figure 9-10)	176	SECTION 12 Financial Transmission and Auction Revenue Rights	
Figure 9-10 Average daily Tier 2 synchronized reserve offer by unit type (MW): January through June 2012 (See 2011 SOM, Figure 9-11)	176	Figure 12-1 Geographic location of top ten binding constraints for the Annual FTR Auction and ARR allocation: Planning period 2012 to 2013 (See 2011 SOM, Figure 12-1)	224
Figure 9-11 PJM RFC Zone Tier 2 synchronized reserve scheduled MW: January through June 2012 (See 2011 SOM, Figure 9-12) Figure 9-12 Tier 2 synchronized reserve purchases by month for the	177	Figure 12-2 Cleared auction volume (MW) as a percent of total FTR cleared volume by calendar month: June 2004 through June 2012 (See 2011 SOM, Figure 12-2)	230
Mid-Atlantic Subzone: January through June 2012 (See 2011 SOM, Figure 9-14)	178	Figure 12-3 Long Term, Annual and Monthly FTR Auction bid and cleared volume: June 2003 through June 2012 (See 2011	
Figure 9-13 Impact of Tier 2 synchronized reserve added MW to the RFC Synchronized Reserve Zone, Mid-Atlantic Subzone: January through June 2012 (See 2011 SOM, Figure 9-15)	178	SOM, Figure 12-3) Figure 12-4 Annual FTR Auction clearing price per MW: Planning period 2012 to 2013 (See 2011 SOM, Figure 12-6)	231
Figure 9-14 Comparison of Mid-Atlantic Subzone Tier 2 synchronized reserve weighted average price and cost (Dollars per MW): January through June 2012 (See 2011 SOM, Figure 9-16)	179	Figure 12-5 Ten largest positive and negative revenue producing FTR sinks purchased in the Annual FTR Auction: Planning period 2012 to 2013 (See 2011 SOM, Figure 12-9)	234
Figure 9-15 Spinning events duration distribution curve, January through June 2009 to 2012 (See 2011 SOM, Figure 9-17) Figure 9-16 Hourly components of DASR clearing price: January	181	Figure 12-6 Ten largest positive and negative revenue producing FTR sources purchased in the Annual FTR Auction: Planning period 2012 to 2013 (See 2011 SOM, Figure 12-10)	235
through June 2012 (See 2011 SOM, Figure 9-18)	182	Figure 12-7 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning	233
SECTION 10 Congestion and Marginal Losses Figure 10-1 PJM monthly congestion (Dollars (Millions)): January		Period FTR Auctions: Planning period 2011 to 2012 (See 2011 SOM, Figure 12-11)	235
2008 to June 2012 (New Figure) Figure 10-2 Location of the top 10 constraints affecting PJM congestion costs: January through June 2012 (New Figure)	194 204	Figure 12-8 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2011 to 2012 (See 2011	
SECTION 11 Generation and Transmission Planning Figure 11-1 Unit retirements in PJM Calendar year 2011 through		SOM, Figure 12-12) Figure 12-9 FTR payout ratio with adjustments by month, excluding and including excess revenue distribution: January 2004 through June 2012 (See 2011 SOM, Figure 12-13)	236
2019 (See 2011 SOM, Figure 11-1)	216	Figure 12-10 Ten largest positive and negative FTR target allocations summed by sink: Planning period 2011 to 2012 (See 2011 SOM, Figure 12-14)	239

x Table of Contents © 2012 Monitoring Analytics, LLC

Figure 12–11 Ten largest positive and negative FTR target allocations summed by source: Planning period 2011 to 2012 (See 2011 SOM	
Figure 12-15)	239
Figure 12-12 FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: January 2005 through June 2012 (New Figure)	240
Figure 12-13 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub: Planning period 2011 to 2012 (See 2011 SOM,	
Figure 12-16)	245

xii Table of Contents © 2012 Monitoring Analytics, LLC

22

Tables

		Table 2-6 PJM hourly Energy Market HHI: January through June 201 and 2012 (See 2011 SOM, Table 2-5)	1 24
SECTION 1 Introduction		Table 2-7 PJM hourly Energy Market HHI (By supply segment):	
Table 1-1 The Energy Market results were competitive (See 2011 SOM,	,	January through June 2012 (See 2011 SOM, Table 2-6)	24
Table 1-1) Table 1-2 The Capacity Market results were competitive (See 2011 SON	4 M,	Table 2-8 Offer-capping statistics: January through June from 2008 2012 (See 2011 SOM, Table 2-7)	to 25
Table 1-2) Table 1-3 The Regulation Market results were not competitive (See 20)	4 11	Table 2-9 Real-time offer-capped unit statistics: January through Jur 2012 (See 2011 SOM, Table 2-8)	ne 25
SOM, Table 1-3)	5	Table 2-10 Three pivotal supplier results summary for regional	
Table 1-4 The Synchronized Reserve Markets results were competitive (See 2011 SOM, Table 1-4)	-	constraints: January through June 2012 (See 2011 SOM, Table 2-9)	26
Table 1-5 The Day-Ahead Scheduling Reserve Market results were	5	Table 2-11 Three pivotal supplier test details for regional constraints: January through June 2012 (See 2011 SOM, Table 2-10)	26
competitive (See 2011 SOM, Table 1-5) Table 1-6 The FTR Auction Markets results were competitive (see 2011	6	Table 2-12 Summary of three pivotal supplier tests applied for regional constraints: January through June 2012 (See 2011 SOM, Table 2-11)	
SOM, Table 1-6)	6	Table 2-13 Marginal unit contribution to PJM real-time, load-	,
Table 1-7 Total price per MWh by category and total revenues by category: January through June 2011 and 2012 (See 2011 SOM,		weighted LMP (By parent company): January through June 2012 (See 2011 SOM, Table 2–12)	27
Table 1-7)	15	Table 2-14 Marginal unit contribution to PJM day-ahead, load-	
SECTION 2 Energy Market		weighted LMP (By parent company): January through June, 2012 (See 2011 SOM, Table 2-13)	28
Table 2-1 The Energy Market results were competitive (See 2011 SOM, Table 2-1)	17	Table 2-15 Type of fuel used (By real-time marginal units): January through June, 2012 (See 2011 SOM, Table 2-14)	28
Table 2-2 PJM generation (By fuel source (GWh)): January through June 2011 and 2012 (See 2011 SOM, Table 2-2)	21	Table 2-16 Day-ahead marginal resources by type/fuel: January through June, 2012 (See 2011 SOM, Table 2-15)	28
Table 2-3 PJM Generation (By fuel source (GWh)): January through June 2011 and 2012; excluding ATSI and DEOK zones (See 2011		Table 2-17 Number of frequently mitigated units and associated unit (By month): January through June, 2012 (See 2011 SOM,	S
SOM, Table 2-2)	21	Table 2-26)	29
Table 2-4 Distribution, of MW for unit offer prices: January through June of 2012 (See 2011 SOM, Table 2-3)	22	Table 2-18 Frequently mitigated units and associated units total months eligible: January through June, 2012 (See 2011 SOM, Table 2-27)	30

Table 2-5 Actual PJM footprint peak loads: January through June of

2003 to 2012 (See 2011 SOM, Table 2-4)

Table 2-19 PJM real-time average hourly load: January through June for years 1998 through 2012 (See 2011 SOM, Table 2-28)	31	Table 2-32 Hourly average of cleared and submitted up-to congestion bids by month: January, 2011 through June, 2012 (See 2011 SOM, Table 2-44)	1 47
Table 2-20 PJM annual Summer THI, Winter WWP and average temperature (Degrees F): cooling, heating and shoulder months of 2007 through June of 2012 (See 2011 SOM, Table 2-30)	32	Table 2-33 PJM INC and DEC bids by type of parent organization (MW): January through June, 2011 and 2012 (See 2011 SOM, Table 2-46)	48
Table 2-21 PJM day-ahead average load: January through June for years 2001 through 2012 (See 2011 SOM, Table 2-31)	33	Table 2-34 PJM up-to congestion transactions by type of parent	
Table 2-22 Cleared day-ahead and real-time load (MWh): January through June for years 2011 and 2012 (See 2011 SOM, Table 2-32)	35	organization (MW): January through June, 2011 and 2012 (See 2011 SOM, Table 2-47)	48
Table 2-23 PJM real-time average hourly generation: January through June for years 2003 through 2012 (See 2011 SOM, Table		Table 2-35 PJM virtual offers and bids by top ten locations (MW): January through June, 2011 and 2012 (See 2011 SOM, Table 2-48)	48
2-33)	37	Table 2-36 PJM cleared up-to congestion import, export and wheel bids by top ten source and sink pairs (MW): January through June,	
Table 2-24 PJM day-ahead average hourly generation: January through June for years 2003 through 2012 (See 2011 SOM,		2011 and 2012 (See 2011 SOM, Table 2-49)	49
Table 2-34)	37	Table 2-37 Day-ahead and real-time average LMP (Dollars per MWh): January through June, 2011 and 2012 (See 2011 SOM, Table 2-50)	
Table 2-25 Day-ahead and real-time generation (MWh): January through June for years 2011 and 2012 (See 2011 SOM, Table 2-35)	38	Table 2-38 Day-ahead and real-time average LMP (Dollars per MWh):	
Table 2-26 PJM real-time, average LMP (Dollars per MWh): January through June, 1998 through 2012 (See 2011 SOM, Table 2-36)	41	January through June, 2001 through 2012 (See 2011 SOM, Table 2-51)	51
Table 2-27 PJM real-time, load-weighted, average LMP (Dollars per MWh): January through June, 1998 through 2012 (See 2011 SOM, Table 2-37)	41	Table 2-39 Frequency distribution by hours of PJM real-time and day-ahead load-weighted hourly LMP difference (Dollars per MWh) January through June, 2007 through 2012 (See 2011 SOM, Table 2-52)): 52
Table 2-28 PJM real-time annual, fuel-cost-adjusted, load-weighted average LMP (Dollars per MWh): Year-over-year method (See 2011 SOM, Table 2-11)	43	Table 2-40 Monthly average percentage of real-time self-supply load, bilateral-supply load and spot-supply load based on parent companies: 2011 through 2012 (See 2011 SOM, Table 2-53)	
Table 2-29 PJM day-ahead, average LMP (Dollars per MWh): January through June, 2001 through 2012 (See 2011 SOM, Table 2-40)	44	Table 2-41 Monthly average percentage of day-ahead self-supply load, bilateral supply load, and spot-supply load based on parent	54
Table 2-30 PJM day-ahead, load-weighted, average LMP (Dollars per MWh): January through June, 2001 through 2012 (See 2011 SOM, Table 2-41)	45	companies: 2011 through 2012 (See 2011 SOM, Table 2-54)	55
Table 2-31 Hourly average volume of cleared and submitted INCs, DECs by month: January, 2011 through June, 2012 (See 2011 SOM, Table 2-43)	46		

xiv Table of Contents © 2012 Monitoring Analytics, LLC

ECTION 3 Operating Reserve		Table 3-16 Credits paid to wind units: Calendar years 2011 and 2012	
Table 3-1 Operating reserve credits and charges (See 2011 SOM,		(See 2011 SOM, Table 3–15)	68
Table 3-1)	58	Table 3-17 Economic vs. noneconomic hours: January through June 2012 (See 2011 SOM, Table 3-16)	68
Table 3-2 Operating reserve deviations (See 2011 SOM, Table 3-2)	59	Table 3-18 Geography of charges and credits: January through	
Table 3-3 Total operating reserve charges: January through June 201 and 2012 (See 2011 SOM, Table 3-6)	59	June 2012 (New Table)	69
Table 3-4 Monthly operating reserve charges: Calendar years 2011 and 2012 (See 2011 SOM, Table 3-7)	60	Table 3-19 Monthly balancing operating reserve charges and credits to generators (Eastern Region): January through June 2012 (See 2011 SOM, Table 3-17)	70
Table 3-5 Monthly balancing operating reserve charges by category: Calendar years 2011 and 2012 (See 2011 SOM, Table 3-8)	60	Table 3-20 Monthly balancing operating reserve charges and credits to generators (Western Region): January through June 2012 (See	
Table 3-6 Regional balancing charges allocation: January through	C1	2011 SOM, Table 3–18)	70
June 2011 (See 2011 SOM, Table 3-9)	61	Table 3-21 Percentage of unit credits and charges of total credits	
Table 3-7 Regional balancing charges allocation: January through June 2012 (See 2011 SOM, Table 3-9)	62	and charges: Calendar years 2011 and 2012 (See 2011 SOM, Table 3-19)	71
Table 3-8 Balancing operating reserve rates (\$/MWh): January through June 2011 and 2012 (See 2011 SOM, Table 3-10)	64	Table 3-22 Day-ahead and balancing operating reserve for load response credits: Calendar year 2011 through June 2012 (See 2011	
Table 3-9 Operating reserve rates statistics (\$/MWh): January		SOM, Table 3-20)	71
through June 2012 (See 2011 SOM, Table 3-11)	64	Table 3-23 Monthly reactive service credits: Calendar years 2011 and	72
Table 3–10 Monthly balancing operating reserve deviations (MWh): Calendar years 2011 and 2012 (See 2011 SOM, Table 3–3)	65	2012 (See 2011 SOM, Table 3-21)	72
Table 3–11 Regional charges determinants (MWh): January through	05	Table 3-24 Reactive service credits by unit type: January through June 2012 (See 2011 SOM, Table 3-22)	72
June 2012 (See 2011 SOM, Table 3-4)	66	Table 3-25 Top 10 operating reserve credits units (By percent of	
Table 3-12 Credits by operating reserve category: January through June 2011 and 2012 (See 2011 SOM, Table 3-12)	66	total system): Calendar years 2001 through June 2012 (See 2011 SOM, Table 3-23)	73
Table 3-13 Credits by unit types (By operating reserve category): January through June 2012 (See 2011 SOM, Table 3-13)	66	Table 3-26 Top 10 units and organizations operating reserve credits: January through June 2012 (New Table)	73
Table 3-14 Credits by operating reserve category (By unit type): January through June 2012 (See 2011 SOM, Table 3-14)	67	Table 3-27 Daily operating reserve credits HHI: January through June 2012 (See 2011 SOM, Table 3-34)	74
Table 3-15 Credits by unit type: January through June 2011 and 201 (New Table)	2 67	Table 3-28 Identification of balancing operating reserve credits received by the top 10 units by category and region: January through June 2012 (See 2011 SOM, Table 3-35)	74

88
to 89
/2008 90
ne 1, 90
1 91
92
6, 93
93
M 94
95
97
2011 98
99
100
100
101
7 31 91 1

xvi Table of Contents © 2012 Monitoring Analytics, LLC

SECTION 5 Demand-Side Response (DSR)		SECTION 6 Net Revenue	
Table 5-1 Overview of Demand Side Programs (See the 2011 SOM, Table 5-1)	104	Table 6-1 Energy Market net revenue for a new entrant gas-fired CT under economic dispatch (Dollars per installed MW-year) (See the	e
Table 5-2 Economic Program registration on peak load days: Calendar years 2002 to 2011 and January through June 2012 (See the 2011 SOM, Table 5-2)	106	2011 SOM, Table 6-3) Table 6-2 PJM Energy Market net revenue for a new entrant gas-fired CC under economic dispatch (Dollars per installed MW-year) (See the 2011 SOM, Table 6-6)	117 118
Table 5-3 Economic Program registrations on the last day of the month: 2008 through June 2012 (See the 2011 SOM, Table 5-3)	106	Table 6-3 PJM Energy Market net revenue for a new entrant CP	110
Table 5-4 Distinct registrations and sites in the Economic Program: June 20, 2012 (See the 2011 SOM, Table 5-4)	107	under economic dispatch (Dollars per installed MW-year) (See the 2011 SOM, Table 6-9)	118
Table 5-5 Performance of PJM Economic Program participants without incentive payments: Calendar years 2002 through 2011 and January through June 2012 (See the 2011 SOM, Table 5-5)	107	SECTION 7 Environmental and Renewable Energy Regulations	
Table 5-6 PJM Economic Program participation by zone: January through June 2011 and 2012 (See the 2011 SOM, Table 5-6)	108	Table 7-1 RGGI CO2 allowance auction prices and quantities: 2009-2011 and 2012-2014 Compliance Period (See 2011 SOM, Table 7-3)	122
Table 5-7 Settlement days submitted by month in the Economic Program: Calendar years 2007 through 2011 and January through June 2012 (See the 2011 SOM, Table 5-7)	109	Table 7-2 Renewable standards of PJM jurisdictions to 2022, (See 2011 SOM, Table 7-4)	123
Table 5-8 Distinct customers and CSPs submitting settlements in the Economic Program by month: Calendar years 2008 through 2011		Table 7-3 Solar renewable standards of PJM jurisdictions to 2022 (See 2011 SOM Table 7-5)	124
and January through June 2012 (See the 2011 SOM, Table 5-8) Table 5-9 Hourly frequency distribution of Economic Program MWh reductions and credits: January through June 2012 (See the 2011	110	Table 7-4 Renewable generation by jurisdiction and renewable resource type (GWh): January through June 2012 (See 2011 SOM, Table 7-8)	125
SOM, Table 5-9) Table 5-10 Frequency distribution of Economic Program zonal,	110	Table 7-5 PJM renewable capacity by jurisdiction (MW), on June 30, 2012 (See 2011 SOM, Table 7-9)	125
load-weighted, average LMP (By hours): January through June 2012 (See the 2011 SOM, Table 5-10)	111	Table 7-6 Renewable capacity by jurisdiction, non-PJM units registered in GATS, (MW), on June 30, 2012 (See 2011 SOM,	3
Table 5-11 Zonal monthly capacity credits: January through June 2012 (See the 2011 SOM, Table 5-13)	112	Table 7-10)	126
Table 5-12 Comparison of Demand Response and Generation	112	Table 7-7 SO2 emission controls (FGD) by unit type (MW), as of June 30, 2012 (See 2011 SOM, Table 7-11)	127
Resources, Calendar year 2011, (New Table)	113	Table 7-8 NOx emission controls by unit type (MW), as of June 30, 2012 (See 2011 SOM, Table 7-12)	127

Table 7-9 Particulate emission controls by unit type (MW), as of June 30, 2012 (See 2011 SOM, Table 7-13)	127	Table 8-10 Day-Ahead scheduled net interchange volume by interfact pricing point (GWh): January through June, 2012 (See 2011 SOM	1,
Table 7-10 Capacity factor of wind units in PJM, January through June 2012 (See 2011 SOM, Table 7-14)	127	Table 8-10) Table 8-11 Up-to Congestion scheduled net interchange volume by	140
Table 7-11 Wind resources in real time offering at a negative price in PJM, January through June 2012 (See 2011 SOM, Table 7-15)	128	interface pricing point (GWh): January through June, 2012 (New Table)	141
Table 7-12 Capacity factor of wind units in PJM by month, 2011 and 2012 (See 2011 SOM, Table 7-16)	129	Table 8-12 Day-Ahead scheduled gross import volume by interface pricing point (GWh): January through June, 2012 (See 2011 SOM, Table 8-11)	, 141
SECTION 8 Interchange Transactions		Table 8-13 Up-to Congestion scheduled gross import volume by interface pricing point (GWh): January through June, 2012 (New	
Table 8-1 Real-time scheduled net interchange volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-1)	134	Table)	142
Table 8-2 Real-time scheduled gross import volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-2)	134	Table 8-14 Day-Ahead scheduled gross export volume by interface pricing point (GWh): January through June, 2012 (See 2011 SOM, Table 8-12)	, 142
Table 8-3 Real-time scheduled gross export volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-3)	135	Table 8-15 Up-to Congestion scheduled gross export volume by interface pricing point (GWh): January through June, 2012 (New	
Table 8-4 Real-time scheduled net interchange volume by interface pricing point (GWh): January through June, 2012 (See 2011 SOM, Table 8-4)	136	Table) Table 8-16 Active interfaces: January through June, 2012 (See 2011 SOM, Table 8-13)	143 143
Table 8-5 Real-time scheduled gross import volume by interface pricing point (GWh): January through June, 2012 (See 2011 SOM,		Table 8-17 Active pricing points: January through June, 2012 (See 2011 SOM, Table 8-14)	144
Table 8-5) Table 8-6 Real-time scheduled gross export volume by interface	137	Table 8-18 Distribution of economic and uneconomic hourly flows between PJM and MISO: January through June, 2012 (New Table)	145
pricing point (GWh): January through June, 2012 (See 2011 SOM, Table 8-6)	137	Table 8-19 Distribution of economic and uneconomic hourly flows between PJM and NYISO: January through June, 2012 (New Table)	147
Table 8-7 Day-Ahead scheduled net interchange volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-7)	138	Table 8-20 Con Edison and PSE&G wheeling settlement data: January through June, 2012 (See 2011 SOM, Table 8-15)	150
Table 8-8 Day-Ahead scheduled gross import volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-8)	139	Table 8-21 Net scheduled and actual PJM flows by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-16)	151
Table 8-9 Day-Ahead scheduled gross export volume by interface (GWh): January through June, 2012 (See 2011 SOM, Table 8-9)	139	Table 8-22 Net scheduled and actual PJM flows by interface pricing point (GWh): January through June, 2012 (See 2011 SOM, Table 8-17)	152

xviii Table of Contents © 2012 Monitoring Analytics, LLC

	Table 8-23 PJM and MISO TLR procedures: January, 2010 through June, 2012 (See 2011 SOM, Table 8-19)	153	Table 9-4 History of ancillary services costs per MW of Load: January through June, 2001 through 2012 (See 2011 SOM, Table 9-4)	y 165
	Table 8-24 Number of TLRs by TLR level by reliability coordinator: January through June, 2012 (See 2011 SOM, Table 8-18)	153	Table 9-5 PJM regulation capability, daily offer and hourly eligible: January through June 2012 (See 2011 SOM, Table 9-5)	167
	Table 8-25 Monthly volume of cleared and submitted up-to congestion bids: January, 2009 through June, 2012 (See 2011		Table 9-6 Impact on PJM Regulation Market of currently regulating units scheduled to retire through 2015 (New Table)	167
	SOM, Table 8-20) Table 8-26 Real-time average hourly LMP comparison for southeast, southwest, SouthIMP and SouthEXP Interface pricing	155	Table 9-7 PJM Regulation Market required MW and ratio of eligible supply to requirement: January through June 2012 and 2011 (See 2011 SOM, Table 9-6)	168
	points: January through June, 2007 through 2012 (See 2011 SOM, Table 8-21)	157	Table 9-8 PJM cleared regulation HHI: January through June 2012 and 2011 (See 2011 SOM, Table 9-7)	168
	Table 8-27 Real-time average hourly LMP comparison for Duke, PEC and NCMPA: January through June, 2012 (See 2011 SOM, Table 8-22)	157	Table 9-9 Regulation market monthly three pivotal supplier results: January through June 2010, 2011 and 2012 (See 2011 SOM, Table 9-9)	169
	Table 8-28 Day-ahead average hourly LMP comparison for southeast, southwest, SouthIMP and SouthEXP Interface pricing points: January through June, 2007 through 2012 (See 2011 SOM, Table 8-23)	158	Table 9-10 Regulation sources: spot market, self-scheduled, bilateral purchases: January through June 2012 (See 2011 SOM, Table 9-10)	170
	Table 8-29 Day-ahead average hourly LMP comparison for Duke, PEC and NCMPA: January through June, 2012 (See 2011 SOM,	130	Table 9-11 Total regulation charges: January through June 2012 (See 2011 SOM, Table 9-11)	172
	Table 8-24)	158	Table 9-12 Comparison of weighted price and cost for PJM Regulation, January through June 2006 through 2012	
Table 8-30 Monthly uncollected congestion charges: Calendar years 2010 and 2011 and January through June, 2012 (See 2011 SOM, Table 8-25)			(See 2011 SOM, Table 9-12)	172
	160	Table 9-13 Synchronized Reserve Market required MW, RFC Zone and Mid-Atlantic Subzone, December 2008 through June 2012		
S	SECTION 9 Ancillary Service Markets		(See 2011 SOM, Table 9-16)	174
	Table 9-1 The Regulation Market results were not competitive (See 2011 SOM, Table 9-1)	163	Table 9-14 Average RFC SRMCP when all cleared synchronized reserve is DSR, average SRMCP, and percent of all cleared hours that all cleared synchronized reserve is DSR: January through	
	Table 9-2 The Synchronized Reserve Markets results were competitive (See 2011 SOM, Table 9-2)	164	June 2010, 2011, 2012 (See 2011 SOM, Table 9-18)	177
	Table 9-3 The Day-Ahead Scheduling Reserve Market results were competitive (See 2011 SOM, Table 9-3)	164	Table 9-15 Comparison of weighted average price and cost for PJM Synchronized Reserve, January through June, 2005 through 2012 (See 2011 SOM, Table 9-19)	179

Table 9-16 Spinning Events, January 2009 through June 2012 (See 2011 SOM, Table 9-20)	180	Table 10-9 Total PJM Marginal Loss Charges (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM,	404
Table 9-17 PJM Day-Ahead Scheduling Reserve Market MW and clearing prices: January through June 2011 and 2012 (See 2011 SOM, Table 9-21)Table 9-18 Black start yearly zonal charges for network transmission	182	Table 10-9) Table 10-10 Total PJM marginal loss costs by category (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM, Table 10-10)	191 192
use: January through June 2012 (See 2011 SOM, Table 9-22) SECTION 10 Congestion and Marginal Losses	183	Table 10-11 Total PJM marginal loss costs by market category (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM, Table 10-11)	192
Table 10-1 PJM real-time, load-weighted average LMP components (Dollars per MWh): January through June, 2009 through 2012 (See 2011 SOM, Table 10-1)	187	Table 10-12 Monthly marginal loss costs by type (Dollars (Millions)): January through June, 2011 and 2012 (See 2011 SOM, Table 10-12)	192
Table 10-2 PJM day-ahead, load-weighted average LMP components (Dollars per MWh): January through June, 2009		Table 10-13 Marginal loss credits (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM, Table 10-13)	193
through 2012 (See 2011 SOM, Table 10-2) Table 10-3 Zonal and PJM real-time, load-weighted average LMP components (Dollars per MWh): January through June, 2011 and	187	Table 10-14 Total PJM congestion (Dollars (Millions)): January through June for calendar years 2008 to 2012 (See 2011 SOM, Table 10-14)	194
2012 (See 2011 SOM, Table 10-3) Table 10-4 Zonal and PJM day-ahead, load-weighted average LMP components (Dollars per MWh): January through June, 2011 and	188	Table 10-15 Total PJM congestion costs by category (Dollars (Millions)): January through June, 2011 and 2012 (See 2011 SOM, Table 10-15)	194
2012 (See 2011 SOM, Table 10-4) Table 10-5 Total PJM charges by component (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM, Table	189	Table 10-16 Total PJM congestion costs by market category (Dollars (Millions)): January through June, 2011 and 2012 (See 2011 SOM, Table 10-16)	195
10-5) Table 10-6 Total PJM energy costs by category (Dollars (Millions)):	190	Table 10-17 Monthly PJM congestion charges (Dollars (Millions)): January through June 2012 (See 2011 SOM, Table 10-17)	195
January through June, 2009 through 2012 (See 2011 SOM, Table 10-6)	190	Table 10-18 Monthly PJM congestion charges (Dollars (Millions)): January through June 2011 (See 2011 SOM, Table 10-18)	195
Table 10-7 Total PJM energy costs by market category (Dollars (Millions)): January through June, 2009 through 2012 (See 2011 SOM, Table 10-7)	190	Table 10-19 Congestion summary (By facility type): January through June 2012 (See 2011 SOM, Table 10-19)	197
Table 10-8 Monthly energy costs by type (Dollars (Millions)): January through June, 2011 and 2012 (See 2011 SOM, Table 10-8)		Table 10–20 Congestion summary (By facility type): January through June 2011 (See 2011 SOM, Table 10–20)	197

xx Table of Contents © 2012 Monitoring Analytics, LLC

Table 10-21 Congestion Event Hours (Day-Ahead against Real Time): January through June 2011 and 2012 (See 2011 SOM, Table 10-21)	198	Table 10-34 Congestion cost by the type of the participant: January through June 2011 (See 2011 SOM, Table 10-34)	208
Table 10-22 Congestion Event Hours (Real Time against		SECTION 11 Generation and Transmission Planning	
Day-Ahead): January through June 2011 and 2012 (See 2011 SOM, Table 10-22)	198	Table 11-1 Year-to-year capacity additions from PJM generation queue: Calendar years 2000 through June 30, 2012	209
Table 10-23 Congestion summary (By facility voltage): January through June 2012 (See 2011 SOM, Table 10-23)	198	Table 11-2 Queue comparison (MW): June 30, 2012 vs. December 31, 2011 (See 2011 SOM, Table 11-3)	210
Table 10-24 Congestion summary (By facility voltage): January through June 2011 (See 2011 SOM, Table 10-24)	199	Table 11-3 Capacity in PJM queues (MW): At June 30, 2012,	210
Table 10-25 Top 25 constraints with frequent occurrence: January through June 2011 and 2012 (See 2011 SOM, Table 10-25)	200	Table 11-4 Average project queue times (days): At June 30, 2012 (See 2011 SOM, Table 11-5)	211
Table 10-26 Top 25 constraints with largest year-to-year change in occurrence: January through June 2011 and 2012 (See 2011 SOM		Table 11-5 Active capacity queued to be in service prior to July 1, 2012 (New table)	211
Table 10-26)	201	Table 11-6 Capacity additions in active or under-construction queues by control zone (MW): At June 30, 2012 (See 2011	
Table 10-27 Top 25 constraints affecting PJM congestion costs		SOM, Table 11-6)	212
(By facility): January through June 2012 (See 2011 SOM, Table 10-27)	202	Table 11-7 Capacity additions in active or under-construction queues by LDA (MW): At June 30, 2012	212
Table 10-28 Top 25 constraints affecting PJM congestion costs (By facility): January through June 2011 (See 2011 SOM, Table 10-28)		Table 11-8 Existing PJM capacity: At June 30, 2012	212
	203	Table 11-9 PJM capacity (MW) by age: at June 30, 2012 (See	210
Table 10-29 Top congestion cost impacts from MISO flowgates		2011 SOM Table 11-9) Table 11-10 Comparison of governous 40 years and older with	213
affecting PJM dispatch (By facility): January through June 2012 (See 2011 SOM, Table 10-29)	205	Table 11-10 Comparison of generators 40 years and older with slated capacity additions (MW): Through 2018	214
Table 10-30 Top congestion cost impacts from MISO flowgates affecting PJM dispatch (By facility): January through June 2011		Table 11-11 Summary of PJM unit retirements (MW): Calendar year 2011 through 2019	215
(See 2011 SOM, Table 10-30)	206	Table 11-12 Planned deactivations of PJM units in Calendar year	
Table 10-31 Regional constraints summary (By facility): January through June 2012 (See 2011 SOM, Table 10-31)	207	2012 as of June 30, 2012 (See 2011 SOM, Table 11-12)	215
Table 10–32 Regional constraints summary (By facility): January through June 2011 (See 2011 SOM, Table 10–32)		Table 11-13 Planned deactivations of PJM units after calendar year 2012, as of June 30, 2012 (See 2011 SOM, Table 11-13)	217
	207	Table 11-14 HEDD Units in PJM as of June 30, 2012	217
Table 10-33 Congestion cost by the type of the participant: January through June 2012 (See 2011 SOM, Table 10-33)	208		

Table 11-15 Unit deactivations: January through June 2012 (See 20 SOM, Table 11-15)	11 218	Table 12-10 Monthly Balance of Planning Period FTR Auction buy-bid, bid and cleared volume (MW per period): January	
Table 11-16 Major upgrade projects in Eastern Region (New Table)	219	through June 2012 (See 2011 SOM, Table 12-12)	230
Table 11-17 Major upgrade projects in Western Region (New Table)	219	Table 12-11 Secondary bilateral FTR market volume: Planning	
Table 11-18 Major upgrade projects in Southern Region (New Table)		periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM, Table 12-13)	
SECTION 12 Financial Transmission and Auction Revenue Rights		Table 12-12 Annual FTR Auction weighted-average cleared prices (Dollars per MW): Planning period 2012 to 2013 (See 2011 SOM, Table 12-15)	232
Table 12-1 The FTR Auction Markets results were competitive (See 2011 SOM, Table 12-1)	221	Table 12-13 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars	
Table 12-2 Top 10 principal binding transmission constraints limiting the Annual FTR Auction: Planning period 2012 to 2013		per MW): January through June 2012 (See 2011 SOM, Table 12-16)	232
(See 2011 SOM, Table 12-3)	225	Table 12-14 Annual FTR Auction revenue: Planning period	222
Table 12-3 Annual FTR Auction patterns of ownership by FTR direction: Planning period 2012 to 2013 (See 2011 SOM, Table 12-5)	226	2012 to 2013 (See 2011 SOM, Table 12–19) Table 12–15 Monthly Balance of Planning Period FTR Auction revenue: January through June 2012 (See 2011 SOM, Table 12–20)	233
Table 12-4 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through June 2012 (See 2011 SOM, Table 12-6)	226	Table 12-16 Total annual PJM FTR revenue detail (Dollars (Millions)) Planning periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM, Table 12-21)	
Table 12-5 Daily FTR net position ownership by FTR direction: January through June 2012 (See 2011 SOM, Table 12-7)	226	Table 12-17 Monthly FTR accounting summary (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM,	
Table 12-6 Annual FTR Auction market volume: Planning period 2012 to 2013 (See 2011 SOM, Table 12-9)	227	Table 12-22)	238
Table 12-7 Directly allocated FTR volume for ATSI and DEOK	221	Table 12-18 FTR payout ratio by planning period (See 2011 SOM, Table 12-23)	239
Control Zones: Planning period 2012 to 2013 (New Table)	228	Table 12-19 FTR profits by organization type and FTR direction:	
Table 12-8 Comparison of self scheduled FTRs: Planning periods from 2008 to 2009 through 2012 to 2013 (See 2011 SOM, Table 8-10)		January through June 2012 (See 2011 SOM, Table 12-24)	240
	228	Table 12-20 Monthly FTR profits by organization type: January through June 2012 (See 2011 SOM, Table 12-25)	240
Table 12-9 Monthly Balance of Planning Period FTR Auction market volume: January through June 2012 (See 2011 SOM, Table 12-11)	229	Table 12-21 Top 10 principal binding transmission constraints limiting the annual ARR allocation: Planning period 2012 to 2013 (See 2011 SOM, Table 12-26)	242
Tubic 12 11)	443	2013 (See 2011 SOW, Table 12-20)	242

xxii Table of Contents © 2012 Monitoring Analytics, LLC

infeasibility for the 2012 to 2013 ARR Allocation (New Table)	242
Table 12–23 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2011, through June 30, 2012 (See 2011 SOM, Table 12–29)	243
Table 12-24 Incremental ARR allocation volume: Planning periods 2008 to 2009 through 2012 to 2013 (See 2011 SOM, Table 12-27	243 (
Table 12-25 IARRs allocated for 2012 to 2013 Annual ARR Allocation for RTEP upgrades (See 2011 SOM, Table 12-28)	243
Table 12-26 Annual ARR allocation volume: Planning periods 2011 to 2012 and 2012 to 2013 (See 2011 SOM, Table 12-30)	244
Table 12-27 ARR revenue adequacy (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012 (See 2011 SOM, Table 12-33)	244
Table 12-28 ARR and self scheduled FTR congestion offset (in millions) by control zone: Planning period 2011to 2012 (See 2011 SOM, Table 12-34)	246
Table 12-29 ARR and FTR congestion offset (in millions) by control zone: Planning period 2011 to 2012 (See 2011 SOM, Table 12-35)	247
Table 12-30 ARR and FTR congestion hedging (in millions): Planning periods 2011 to 2012 and 2012 to 2013 through June 30, 2012 (See 2011 SOM, Table 12-36)	247
,	

xxiv Table of Contents © 2012 Monitoring Analytics, LLC