



TABLE OF CONTENTS

PREFACE I

SECTION 1 - INTRODUCTION..... 1

PJM Market Background 1

Conclusions 2

Role of MMU 4

Reporting 5

Monitoring 5

Market Design 6

Recommendations 6

Highlights 6

Section 2, Energy Market, Part 1 6

Section 3, Energy Market, Part 2 7

Section 4, Interchange Transactions 8

Section 5, Capacity Markets 9

Section 6, Ancillary Services 9

Section 7, Congestion 10

Section 8, Financial Transmission Rights and Auction Revenue Rights 10

Total Price of Wholesale Power 11

Components of Total Price 11

SECTION 2 – ENERGY MARKET, PART 1 13

Highlights 13

Recommendations 15

Overview 15

Market Structure 15

Market Performance: Load, Generation and Locational Marginal Price 16

Demand-Side Response 17

Conclusion 18

Market Structure 19

Supply 19

Demand 19

Market Concentration 20

Local Market Structure and Offer Capping 21

Local Market Structure 22

Frequently Mitigated Unit and Associated Unit Adders 23

Market Performance: Load and LMP 25

Load 25

Locational Marginal Price (LMP) 31

Load and Spot Market 43

Demand-Side Response (DSR) 46

PJM Load Response Programs Overview 46

SECTION 3 - ENERGY MARKET, PART 2 55

Highlights 55

Recommendations 56

Overview 56

Net Revenue 56

Existing and Planned Generation 56

Environmental Rules 57

Scarcity 58



TABLE OF CONTENTS

2011 Quarterly State of the Market Report for PJM: January through September

Credits and Charges for Operating Reserve.	58
Conclusion.	59
<i>Net Revenue.</i>	<i>60</i>
Capacity Market Net Revenue	60
New Entrant Net Revenues.	60
New Entrant Combustion Turbine	62
New Entrant Combined Cycle	62
New Entrant Coal Plant	63
New Entrant Day-Ahead Net Revenues	63
Net Revenue Adequacy	65
<i>Existing and Planned Generation</i>	<i>70</i>
Installed Capacity and Fuel Mix.	70
Energy Production by Fuel Source.	71
Planned Generation Additions	72
<i>Environmental Impact and Renewables</i>	<i>77</i>
Characteristics of Wind Units	77
Environmental Regulatory Impacts	79
Renewable Portfolio Standards	81
<i>Scarcity and Scarcity Pricing</i>	<i>86</i>
High-Load Events: January through September 2011	86
<i>Operating Reserve.</i>	<i>87</i>
Credit and Charge Results.	87
Characteristics of Credits and Charges	90
Impacts of Revised Operating Reserve Rules	91
Issues in Operating Reserves	93
Parameter Limited Schedules	96

SECTION 4 - INTERCHANGE TRANSACTIONS 97

<i>Highlights</i>	<i>97</i>
<i>Recommendations</i>	<i>97</i>
<i>Overview.</i>	<i>97</i>
Interchange Transaction Activity	97
Interactions with Bordering Areas.	99
Conclusion.	104
<i>Interchange Transaction Activity</i>	<i>105</i>
Aggregate Imports and Exports.	105
Interface Imports and Exports.	107
<i>Interface Pricing</i>	<i>113</i>
<i>Interactions with Bordering Areas.</i>	<i>115</i>
PJM Interface Pricing with Organized Markets	115
Operating Agreements with Bordering Areas	119
Other Agreements/Protocols with Bordering Areas	119
<i>Interchange Transaction Issues.</i>	<i>119</i>
Loop Flows	119
TLR Procedures	121
Up-To Congestion	121
Interface Pricing Agreements with Individual Balancing Authorities	124
Willing to Pay Congestion and Not Willing to Pay Congestion	128
Spot Import	128

SECTION 5 – CAPACITY MARKET 129

<i>Highlights</i>	<i>129</i>
<i>Recommendations</i>	<i>130</i>
<i>Overview.</i>	<i>130</i>



RPM Capacity Market	130	Market Conduct	165
Generator Performance	132	Market Performance	167
Conclusion	132	<i>Day Ahead Scheduling Reserve (DASR)</i>	<i>170</i>
<i>RPM Capacity Market</i>	<i>134</i>	Market Performance	170
Market Structure	134	<i>Black Start Service</i>	<i>171</i>
Market Performance	139	SECTION 7 – CONGESTION	173
<i>Generator Performance</i>	<i>142</i>	<i>Highlights</i>	<i>173</i>
Generator Performance Factors	142	<i>Recommendations</i>	<i>174</i>
Generator Forced Outage Rates	143	<i>Overview</i>	<i>174</i>
SECTION 6 - ANCILLARY SERVICE MARKETS	149	Congestion Cost	174
<i>Highlights</i>	<i>150</i>	Congestion Component of LMP and Facility or Zonal Congestion	174
<i>Recommendations</i>	<i>151</i>	Key Backbone Facilities	176
<i>Overview</i>	<i>151</i>	Conclusion	176
Regulation Market	151	<i>Congestion</i>	<i>177</i>
Synchronized Reserve Market	152	Total Calendar Year Congestion	177
DASR	154	Monthly Congestion	177
Black Start Service	155	Congestion Component of LMP	178
Ancillary Services costs per MW of load: 2001 - 2011	156	<i>Congested Facilities</i>	<i>179</i>
Conclusion	156	Congestion by Facility Type and Voltage	179
<i>Regulation Market</i>	<i>157</i>	Constraint Duration	182
Market Structure	157	Constraint Costs	184
Market Conduct	158	Congestion-Event Summary for MISO Flowgates	187
Market Performance	159	Congestion-Event Summary for the 500 kV System	189
Analysis of Regulation Market Changes	160	<i>Zonal Congestion</i>	<i>190</i>
<i>Synchronized Reserve Market</i>	<i>164</i>	Summary	190
Market Structure	164		



**SECTION 8 – FINANCIAL TRANSMISSION AND
AUCTION REVENUE RIGHTS 193**

Highlights 193

Recommendations 194

Overview 194

Financial Transmission Rights 194

Auction Revenue Rights 196

Conclusion 196

Financial Transmission Rights 197

Market Structure 197

Market Performance 198

Auction Revenue Rights 208

Market Structure 208

Market Performance 208

ARR and FTR Revenue and Congestion 209

FTR Prices and Zonal Price Differences 209

Effectiveness of ARRs as a Hedge against Congestion 210

Effectiveness of ARRs and FTRs as a Hedge against Congestion . . . 211

ARRs and FTRs as a Hedge against Total Real Time Energy Charges . 212



TABLES

SECTION 1 - INTRODUCTION..... 1

Table 1-1 The Energy Market results were competitive.....	2
Table 1-2 The Capacity Market results were competitive.....	3
Table 1-3 The Regulation Market results were not competitive.....	3
Table 1-4 The Synchronized Reserve Markets results were competitive.....	4
Table 1-5 The Day-Ahead Scheduling Reserve Market results were competitive.....	4
Table 1-6 The FTR Auction Markets results were competitive.....	4
Table 1-7 Total price per MWh by category and total revenues by category: January through September of 2010 and 2011 (See 2010 SOM, Table 1-7) ...	12

SECTION 2 – ENERGY MARKET, PART 1..... 13

Table 2-1 The Energy Market results were competitive.....	13
Table 2-2 Frequency distribution of day-ahead unit offer prices: July through September 2011 (See 2010 SOM, Table 2-3).....	19
Table 2-3 Actual PJM footprint peak loads: July through September of 2002 to 2011 (See 2010 SOM, Table 2-4).....	19
Table 2-4 PJM hourly Energy Market HHI: January through September 2011 (See 2010 SOM, Table 2-5).....	20
Table 2-5 PJM hourly Energy Market HHI (By supply segment): January through September 2011 (See 2010 SOM, Table 2-6).....	20
Table 2-6 Annual offer-capping statistics: Calendar years 2006 through September 2011 (See 2010 SOM, Table 2-7).....	21
Table 2-7 Real-time offer-capped unit statistics: January through September 2011 (See 2010 SOM, Table 2-8).....	21
Table 2-8 Three pivotal supplier results summary for regional constraints: January through September 2011 (See 2010 SOM, Table 2-9).....	22
Table 2-9 Three pivotal supplier test details for regional constraints: January through September 2011 (See 2010 SOM, Table 2-10).....	22
Table 2-10 Summary of three pivotal supplier tests applied to uncommitted units for regional constraints: January through September 2011 (See 2010 SOM, Table 2-11).....	23
Table 2-11 Frequently mitigated units and associated units (By month): January through September 2011 (See 2010 SOM, Table 2-26).....	23
Table 2-12 Frequently mitigated units and associated units total months eligible: January through September 2011 (See 2010 SOM, Table 2-27).....	24
Table 2-13 PJM real-time average hourly load: January through September 1998 through 2011 (See 2010 SOM, Table 2-28).....	25
Table 2-14 PJM annual Summer THI, Winter WWP and average temperature (Degrees F): cooling, heating and shoulder months of 2007 through September 2011 (See 2010 SOM, Table 2-30).....	26
Table 2-15 PJM day-ahead average load: January through September 2000 through 2011 (See 2010 SOM, Table 2-31).....	27
Table 2-16 Cleared day-ahead and real-time load (MWh): January through September 2010 and 2011 (See 2010 SOM, Table 2-32).....	28

Table 2-17 Day-ahead and real-time generation (MWh): January through September 2010 and 2011 (See 2010 SOM, Table 2-33).....	30
Table 2-18 PJM real-time, simple average LMP (Dollars per MWh): January through September 1998 through 2011 (See 2010 SOM, Table 2-34).....	32
Table 2-19 PJM real-time, load-weighted, average LMP (Dollars per MWh): January through September 1998 through 2011 (See 2010 SOM, Table 2-38).....	32
Table 2-20 PJM day-ahead, simple average LMP (Dollars per MWh): January through September 2000 through 2011 (See 2010 SOM, Table 2-43).....	34
Table 2-21 PJM day-ahead, load-weighted, average LMP (Dollars per MWh): January through September 2000 through 2011 (See 2010 SOM, Table 2-46).....	34
Table 2-22 Monthly volume of cleared and submitted INCs, DECIs: January 2010 through September 2011 (See 2010 SOM, Table 2-61).....	36
Table 2-23 Daily average of cleared and submitted up-to congestion bids by month: January 2010 through September 2011 (New Table).....	37
Table 2-24 PJM INC and DEC bids by type of parent organization (MW): January through September 2011 (See 2010 SOM, Table 2-63).....	37
Table 2-25 PJM virtual offers and bids by top ten aggregates (MW): January through September 2010 and 2011 (See 2010 SOM, Table 2-64).....	38
Table 2-26 PJM cleared up-to congestion import, export and wheel bids by top ten source and sink pairs (MW): January through September 2010 and 2011 (New Table).....	39
Table 2-27 Day-ahead and real-time simple average LMP (Dollars per MWh): January through September 2010 and 2011 (See 2010 SOM, Table 2-65).....	40
Table 2-28 Day-ahead and real-time simple average LMP (Dollars per MWh): January through September 2000 through 2011 (See 2010 SOM, Table 2-66).....	41
Table 2-29 Frequency distribution by hours of PJM real-time and day-ahead load-weighted hourly LMP difference (Dollars per MWh): January through September 2007 through 2011 (See 2010 SOM, Table 2-67).....	41
Table 2-30 Monthly average percentage of real-time self-supply load, bilateral-supply load and spot-supply load based on parent companies: Calendar years 2010 through September 2011 (See 2010 SOM, Table 2-70).....	43
Table 2-31 Monthly average percentage of day-ahead self-supply load, bilateral supply load, and spot-supply load based on parent companies: Calendar years 2010 through September 2011 (See 2010 SOM, Table 2-71).....	44
Table 2-32 PJM real-time, simple average LMP components (Dollars per MWh): January through September 2008 to 2011 (See 2010 SOM, Table 2-50).....	44
Table 2-33 PJM day-ahead, simple average LMP components (Dollars per MWh): January through September 2008 to 2011 (See 2010 SOM, Table 2-54).....	45



Table 2-34 Marginal loss costs and loss credits: January through September 2008 to 2011 (See 2010 SOM, Table 2-57)	45
Table 2-35 Marginal loss costs by type (Dollars (Millions)): January through September 2011 (See 2010 SOM, Table 2-58)	46
Table 2-36 Overview of Demand Side Programs (See 2010 SOM, Table 2-72)	46
Table 2-37 Economic Program registration on peak load days: Calendar years 2002 to 2010 and January through September 2011 (See 2010 SOM, Table 2-73).	47
Table 2-38 Economic Program registrations on the last day of the month: January 2008 through September 2011 (See 2010 SOM, Table 2-74)	48
Table 2-39 Distinct registrations and sites in the Economic Program: July 21, 2011 (See 2010 SOM, Table 2-75)	49
Table 2-40 PJM Economic Program participation by zone: January through September 2010 and 2011 (See 2010 SOM, Table 2-78)	50
Table 2-41 Settlement days submitted by month in the Economic Program: Calendar years 2008 through 2010 and January through September 2011 (See 2010 SOM, Table 2-79)	51
Table 2-42 Distinct customers and CSPs submitting settlements in the Economic Program by month: Calendar years 2008 through 2010 and January through September 2011 (See 2010 SOM, Table 2-80)	51
Table 2-43 Hourly frequency distribution of Economic Program MWh reductions and credits: January through September 2011 (See 2010 SOM, Table 2-81).	52
Table 2-44 Frequency distribution of Economic Program zonal, load-weighted, average LMP (By hours): January through September 2011 (See 2010 SOM, Table 2-82).	53
Table 2-45 Zonal monthly capacity credits: January through September 2011 (See 2010 SOM, Table 2-85)	54

SECTION 3 - ENERGY MARKET, PART 2 55

Table 3-1 Capacity revenue by PJM zones (Dollars per MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-4)	60
Table 3-2 PJM Real-Time Energy Market net revenue for a new entrant gas-fired CT under economic dispatch (Dollars per installed MW-year): Net revenue for January through September 2010 and 2011 (See 2010 SOM, Table 3-5). . .	60
Table 3-3 PJM Real-Time Energy Market net revenue for a new entrant gas-fired CC under economic dispatch (Dollars per installed MW-year): Net revenue for January through September 2010 and 2011 (See 2010 SOM, Table 3-6). . .	61
Table 3-4 PJM Real-Time Energy Market net revenue for a new entrant CP under economic dispatch (Dollars per installed MW-year): Net revenue for January through September 2010 and 2011 (See 2010 SOM, Table 3-7)	61
Table 3-5 Real-time PJM-wide net revenue for a CT under peak-hour, economic dispatch by market (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-8)	62
Table 3-6 Real-time zonal combined net revenue from all markets for a CT under peak-hour, economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-9)	62
Table 3-7 Real-time PJM-wide net revenue for a CC under peak-hour, economic dispatch by market (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-10)	62

Table 3-8 Real-time zonal combined net revenue from all markets for a CC under peak-hour, economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-11)	62
Table 3-9 Real-time PJM-wide net revenue for a CP under peak-hour, economic dispatch by market (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-12)	63
Table 3-10 Real-time zonal combined net revenue from all markets for a CP under peak-hour, economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-13)	63
Table 3-11 PJM Day-Ahead Energy Market net revenue for a new entrant gas-fired CT under economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-14)	63
Table 3-12 PJM Day-Ahead Energy Market net revenue for a new entrant gas-fired CC under economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-15)	64
Table 3-13 PJM Day-Ahead Energy Market net revenue for a new entrant CP under economic dispatch (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-16)	64
Table 3-14 Real-Time and Day-Ahead Energy Market net revenues for a CT under economic dispatch (Dollars per installed MW-year): Calendar years 2000 to 2010 and January through September 2011 (See 2010 SOM, Table 3-17)	65
Table 3-15 Real-Time and Day-Ahead Energy Market net revenues for a CC under economic dispatch scenario (Dollars per installed MW-year): Calendar years 2000 to 2010 and January through September 2011 (See 2010 SOM, Table 3-18)	65
Table 3-16 Real-Time and Day-Ahead Energy Market net revenues for a CP under economic dispatch scenario (Dollars per installed MW-year): Calendar years 2000 to 2010 and January through September 2011 (See 2010 SOM, Table 3-19)	65
Table 3-17 New entrant 20-year levelized fixed costs (By plant type (Dollars per installed MW-year)): Calendar years 2005 through 2010 (See 2010 SOM, Table 3-20).	65
Table 3-18 CT 20-year levelized fixed cost vs. real-time economic dispatch, zonal net revenue (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-22).	66
Table 3-19 CC 20-year levelized fixed cost vs. real-time economic dispatch, zonal net revenue (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-24).	67
Table 3-20 CP 20-year levelized fixed cost vs. real-time economic dispatch, zonal net revenue (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Table 3-26).	69
Table 3-21 PJM installed capacity (By fuel source): January 1, May 31, June 1, and September 30, 2011 (See 2010 SOM, Table 3-42).	70
Table 3-22 PJM generation (By fuel source (GWh)): January through September 2010 and 2011 (See 2010 SOM, Table 3-43).	71
Table 3-23 PJM capacity factor (By unit type (GWh)): January through September 2010 and 2011 (New table)	71
Table 3-24 Year-to-year capacity additions from PJM generation queue: Calendar years 2000 through September 30, 2011 (See 2010 SOM, Table 3-44).	72



Table 3-25 Queue comparison (MW): September 30, 2011 vs. December 31, 2010 (See 2010 SOM, Table 3-44)	72
Table 3-26 Capacity in PJM queues (MW): At September 30, 2011 (See 2010 SOM, Table 3-46)	72
Table 3-27 Average project queue times (days): At September 30, 2011 (See 2010 SOM, Table 3-47)	73
Table 3-28 Capacity additions in active or under-construction queues by control zone (MW): At September 30, 2011 (See 2010 SOM, Table 3-48)	73
Table 3-29 Capacity additions in active or under-construction queues by LDA (MW): At September 30, 2011 (See 2010 SOM, Table 3-49)	73
Table 3-30 Existing PJM capacity: At September 30, 2011 (By zone and unit type (MW)) (See 2010 SOM, Table 3-50)	74
Table 3-31 PJM capacity (MW) by age: at September 30, 2011 (See 2010 SOM, Table 3-51)	75
Table 3-32 Comparison of generators 40 years and older with slated capacity additions (MW): Through 2018 (See 2010 SOM, Table 3-52)	75
Table 3-33 Capacity factor of wind units in PJM, January through September 2011 (See 2010 SOM, Table 3-53)	77
Table 3-34 Wind resources in real time offering at a negative price in PJM, January through September 2011 (See 2010 SOM, Table 3-54)	77
Table 3-35 Capacity factor of wind units in PJM by month, 2010 and 2011 (See 2010 SOM, Table 3-55)	77
Table 3-36 Table 3-16 Peak and off-peak seasonal capacity factor, average wind generation (MWh), and PJM load (MWh): January through September 2011 (See 2010 SOM, Table 3-56)	77
Table 3-37 RGGI CO ₂ allowance auction prices and quantities: 2009-2011 Compliance Period (See 2010 SOM, Table 3-57)	79
Table 3-38 SO ₂ emission controls (FGD) by unit type (MW), as of September 30, 2011 (See 2010 SOM, Table 3-58)	79
Table 3-39 NO _x emission controls by unit type (MW), as of September 30, 2011 (See 2010 SOM, Table 3-59)	80
Table 3-40 Particulate emission controls by unit type (MW), as of September 30, 2011 (See 2010 SOM, Table 3-60)	80
Table 3-41 2012 and 2014 assurance levels for SO ₂ , NO _x , and O ₃ season NO _x emissions (New table)	80
Table 3-42 HEDD maximum NO _x emission rates (New table)	80
Table 3-43 Renewable standards of PJM jurisdictions to 2021 (See 2010 SOM, Table 3-61)	81
Table 3-44 Solar renewable standards of PJM jurisdictions to 2021 (See 2010 SOM, Table 3-62)	82
Table 3-45 Additional renewable standards of PJM jurisdictions to 2021 (See 2010 SOM, Table 3-63)	82
Table 3-46 Renewable alternative compliance payments in PJM jurisdictions: 2011 (See 2010 SOM, Table 3-64)	83
Table 3-47 Renewable generation by jurisdiction and renewable resource type (GWh): January through September 2011 (See 2010 SOM, Table 3-65)	83
Table 3-48 PJM renewable capacity by jurisdiction (MW), on September 30, 2011 (See 2010 SOM, Table 3-66)	84
Table 3-49 Renewable capacity by jurisdiction, non-PJM units registered in GATS (MW), on September 30, 2011 (See 2010 SOM, Table 3-67)	85

Table 3-50 Monthly operating reserve charges: Calendar years 2010 and 2011 (See SOM 2010, Table 3-72)	87
Table 3-51 Regional balancing operating reserve charges allocation: January through September 2011 (See SOM 2010, Table 3-73)	88
Table 3-52 Monthly balancing operating reserve deviations (MWh): Calendar years 2010 and 2011 (See SOM 2010, Table 3-74)	88
Table 3-53 Regional operating reserve charges determinants (MWh): January through September 2011 (See SOM 2010, Table 3-75)	89
Table 3-54 Operating reserve credits by month (By operating reserve market): January through September 2011 (See SOM 2010, Table 3-79)	90
Table 3-55 Operating reserve credits by unit types (By operating reserve market): January through September 2011 (See SOM 2010, Table 3-80)	90
Table 3-56 Credits by operating reserve market (By unit type): January through September 2011 (See SOM 2010, Table 3-81)	91
Table 3-57 Regional balancing operating reserve credits: January through September 2011 (See SOM 2010, Table 3-86)	91
Table 3-58 Total deviations: January through September 2011 (See SOM 2010, Table 3-87)	91
Table 3-59 Actual regional credits, charges, rates and charge allocation (MWh): January through September 2011 (See SOM 2010, Table 3-89)	92
Table 3-60 Total virtual bids and amount of virtual bids paying balancing operating charges (MWh): Calendar years 2010 and 2011 (See SOM 2010, Table 3-91)	92
Table 3-61 Unit operating reserve credits (By zone): January through September 2011 (See SOM 2010, Table 3-100)	93
Table 3-62 Top 10 units and organizations receiving total operating reserve credits: January through September 2011 (See SOM 2010, Table 3-101)	94
Table 3-63 Top 10 units and organizations receiving day-ahead generator credits: January through September 2011 (See SOM 2010, Table 3-102)	94
Table 3-64 Top 10 units and organizations receiving synchronous condensing credits: January through September 2011 (See SOM 2010, Table 3-103)	94
Table 3-65 Top 10 units and organizations receiving balancing generator credits: January through September 2011 (See SOM 2010, Table 3-104)	94
Table 3-66 Top 10 units and organizations receiving lost opportunity cost credits: January through September 2011 (See SOM 2010, Table 3-105)	95
Table 3-67 PJM Unit Parameter Limited Schedule Matrix (See SOM 2010, Table 3-97)	96

SECTION 4 - INTERCHANGE TRANSACTIONS 97

Table 4-1 Real-time scheduled net interchange volume by interface (GWh): January through September 2011 (See 2010 SOM, Table 4-1)	107
Table 4-2 Real-time scheduled gross import volume by interface (GWh): January through September 2011 (See 2010 SOM, Table 4-2)	108
Table 4-3 Real-time scheduled gross export volume by interface (GWh): January through September 2011 (See 2010 SOM, Table 4-3)	109
Table 4-4 Day-ahead net interchange volume by interface (GWh): January through September 2011 (See 2010 SOM, Table 4-4)	110
Table 4-5 Day-ahead gross import volume by interface (GWh): January through September 2011 (See 2010 SOM, Figure 4-5)	111



Table 4-6 Day-ahead gross export volume by interface (GWh): January through September 2011 (See 2010 SOM, Figure 4-6)	112
Table 4-7 Active interfaces: January through September 2011 (See 2010 SOM, Figure 4-7).	113
Table 4-8 Active pricing points: 2011 (See 2010 SOM, Table 4-8)	114
Table 4-9 Con Edison and PSE&G wheeling settlement data: January through September 2011 (See 2010 SOM, Table 4-9).	119
Table 4-10 Net scheduled and actual PJM interface flows (GWh): January through September 2011 (See 2010 SOM, Table 4-10).	119
Table 4-11 Table 4-11 PJM and MISO TLR procedures: Calendar year 2010 and January through September 2011 (See 2010 SOM, Figure 4-16, Figure 4-17 and Figure 4-18).	121
Table 4-12 Number of TLRs by TLR level by reliability coordinator: January through September 2011 (See 2010 SOM, Table 4-11).	121
Table 4-13 Monthly volume of cleared and submitted up-to congestion bids: January, 2009, through September, 2011. (See 2010 SOM, Table 4-12)	122
Table 4-14 Real-time average hourly LMP comparison for southeast, southwest, SouthIMP and SouthEXP Interface pricing points: January through September 2007 through 2011 (See 2010 SOM, Table 4-13).	124
Table 4-15 Real-time average hourly LMP comparison for Duke, PEC and NCMPA: January through September 2011 (See 2010 SOM, Table 4-14)	124
Table 4-16 Day-ahead average hourly LMP comparison for southeast, southwest, SouthIMP and SouthEXP Interface pricing points: January through September 2007 through 2011 (See 2010 SOM, Table 4-15).	126
Table 4-17 Day-ahead average hourly LMP comparison for Duke, PEC and NCMPA: January through September 2011 (See 2010 SOM, Table 4-16).	126
Table 4-18 Monthly uncollected congestion charges: Calendar year 2010 and January through September 2011 (See 2010 SOM, Figure 4-26)	128
SECTION 5 – CAPACITY MARKET	129
Table 5-1 The Capacity Market results were competitive	129
Table 5-2 RPM Related MMU Reports, 2011 (New Table).	133
Table 5-3 RPM generation capacity additions: 2007/2008 through 2014/2015 (See 2010 SOM, Table 5-3)	134
Table 5-4 Preliminary market structure screen results: 2011/2012 through 2014/2015 RPM Auctions (See 2010 SOM, Table 5-5)	135
Table 5-5 RSI results: 2011/2012 through 2014/2015 RPM Auctions (See 2010 SOM, Table 5-6)	136
Table 5-6 RPM load management statistics by LDA: June 1, 2010 to June 1, 2014 (See 2010 SOM, Table 5-8)	137
Table 5-7 RPM load management cleared capacity and ILR: 2007/2008 through 2014/2015 (See 2010 SOM, Table 5-9)	138
Table 5-8 RPM load management statistics: June 1, 2007 to June 1, 2014 (See 2010 SOM, Table 5-10)	138
Table 5-9 Capacity prices: 2007/2008 through 2014/2015 RPM Auctions (See 2010 SOM, Table 5-14)	139
Table 5-10 RPM revenue by type: 2007/2008 through 2014/2015 (See 2010 SOM, Table 5-15)	140

Table 5-11 RPM cost to load: 2011/2012 through 2014/2015 (See 2010 SOM, Table 5-16)	141
Table 5-12 PJM EFORd data: January through September 2007 to 2011 (See 2010 SOM, Table 5-20)	143
Table 5-13 Contribution to EFORd for specific unit types (Percentage points): January through September 2007 to 2011 (See 2010 SOM, Figure 5-21)	144
Table 5-14 Contribution to EFORd by unit type by cause: January through September 2011 (See 2010 SOM, Table 5-22).	145
Table 5-15 Contributions to Economic Outages: January through September 2011 (See 2010 SOM, Table 5-23)	146
Table 5-16 Contribution to EFORd by unit type: January through September 2011 (See 2010 SOM, Table 5-24)	146
Table 5-17 OMC Outages: January through September 2011 (See 2010 SOM, Table 5-25)	146
Table 5-18 PJM EFORd vs. XEFORd: January through September 2011 (See 2010 SOM, Table 5-26)	146
Table 5-19 Contribution to EFORp by unit type (Percentage points): January through September 2010 and 2011 (See 2010 SOM, Table 5-27)	146
Table 5-20 PJM EFORp data by unit type: January through September 2010 and 2011 (See 2010 SOM, Table 5-28).	147
Table 5-21 Contribution to PJM EFORd, XEFORd and EFORp by unit type: January through September 2011 (See 2010 SOM, Table 5-29)	147
Table 5-22 PJM EFORd, XEFORd and EFORp data by unit type: January through September 2011 (See 2010 SOM, Table 5-30)	147

SECTION 6 - ANCILLARY SERVICE MARKETS 149

Table 6-1 The Regulation Market results were not competitive	149
Table 6-2 The Synchronized Reserve Markets results were competitive	150
Table 6-3 The Day-Ahead Scheduling Reserve Market results were competitive	150
Table 6-4 History of ancillary services costs per MW of Load: January through September of 2001 through 2011 (See 2010 SOM, Table 6-4).	156
Table 6-5 PJM regulation capability, daily offer and hourly eligible: January through September 2011 (See 2010 SOM, Table 6-5)	157
Table 6-6 PJM Regulation Market required MW and ratio of eligible supply to requirement: January through September 2011 (See 2010 SOM, Table 6-6)	157
Table 6-7 PJM cleared regulation HHI: January through September 2011 (See 2010 SOM, Table 6-7)	157
Table 6-8 Highest annual average hourly Regulation Market shares: January through September, 2011 (See 2010 SOM, Table 6-8).	157
Table 6-9 Regulation market monthly three pivotal supplier results: January through September, 2011 (See 2010 SOM, Table 6-9).	158
Table 6-10 Regulation sources: spot market, self-scheduled, bilateral purchases: January through September, 2011 (See 2010 SOM, Table 6-10).	158
Table 6-11 Total regulation charges: January through September, 2011 (See 2010 SOM, Table 6-11)	160



Table 6-12 Comparison of load weighted price and cost for PJM Regulation, August 2005 through September 2011 (See 2010 SOM, Table 6-12)	160
Table 6-13 Summary of changes to Regulation Market design (See 2010 SOM, Table 6-13).	160
Table 6-14 Impact of \$12 adder to cost based regulation offer: December 2008 through September 2011 (See 2010 SOM, Table 6-14)	161
Table 6-15 Additional credits paid to regulating units from no longer netting credits above RMCP against operating reserves: December 2008 through September 2011 (See 2010 SOM, Table 6-15)	163
Table 6-16 Synchronized Reserve Market required MW, RFC zone and Mid-Atlantic subzone, December 2008 through September 2011 (New table)	164
Table 6-17 Mid-Atlantic Subzone Tier 2 Synchronized Reserve Market cleared market shares: January through September, 2011 (See 2010 SOM, Table 6-16)	165
Table 6-18 Average 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 September 2010 and 2011 (See 2010 SOM, Table 6-17)	166
Table 6-19 Comparison of load weighted average price and cost for PJM Synchronized Reserve, January through September 2005 through 2011 (See 2010 SOM, Table 6-18)	168
Table 6-20 Spinning Events, January 2009 through September 2011. (New table)	169
Table 6-21 PJM, Day-Ahead Scheduling Reserve Market MW and clearing prices: January through September, 2011 (See 2010 SOM, Table 6-20).	170
Table 6-22 Black start yearly zonal charges for network transmission use: January through September, 2011 (See 2010 SOM, Table 6-21).	171

SECTION 7 – CONGESTION 173

Table 7-1 Total PJM congestion (Dollars (Millions)): January through September for calendar years 2006 to 2011 (See 2010 SOM, Table 7-1).	177
Table 7-2 Total annual PJM congestion costs by category (Dollars (Millions)): January through September, 2010 and 2011 (See 2010 SOM, Table 7-2).	177
Table 7-3 Monthly PJM congestion charges (Dollars (Millions)): January through September, 2010 and 2011 (See 2010 SOM, Table 7-3).	177
Table 7-4 Annual average congestion component of LMP: January through September 2010 and 2011 (See 2010 SOM, Table 7-4).	178
Table 7-5 Congestion summary (By facility type): January through September 2011 (See 2010 SOM, Table 7-5)	179
Table 7-6 Congestion summary (By facility type): January through September 2010 (See 2011 SOM, Table 7-6)	179
Table 7-7 Congestion Event Hours (Day Ahead against Real Time): January through September 2010 and 2011 (See 2010 SOM, Table 7-7).	180
Table 7-8 Congestion Event Hours (Real Time against Day Ahead): January through September 2010 and 2011 (See 2010 SOM, Table 7-8)	180
Table 7-9 Congestion summary (By facility voltage): January through September 2011 (See 2010 SOM, Table 7-9)	181

Table 7-10 Congestion summary (By facility voltage): January through September 2010 (See 2010 SOM, Table 7-10)	181
Table 7-11 Top 25 constraints with frequent occurrence: January through September 2010 to 2011 (See 2010 SOM, Table 7-11).	182
Table 7-12 Top 25 constraints with largest year-to-year change in occurrence: January through September 2010 to 2011 (See 2010 SOM, Table 7-12).	183
Table 7-13 Top 25 constraints affecting annual PJM congestion costs (By facility): January through September 2011 (See 2010 SOM, Table 7-13).	184
Table 7-14 Top 25 constraints affecting annual PJM congestion costs (By facility): January through September 2010 (See 2010 SOM, Table 7-14).	185
Table 7-15 Congestion cost by the type of the participant: January through September 2011 (New table)	186
Table 7-16 Congestion cost by the type of the participant: January through September 2010 (New table)	186
Table 7-17 Top congestion cost impacts from MISO flowgates affecting PJM dispatch (By facility): January through September 2011 (See 2010 SOM, Table 7-15)	187
Table 7-18 Top congestion cost impacts from MISO flowgates affecting PJM dispatch (By facility): January through September 2010 (See 2010 SOM, Table 7-16)	188
Table 7-19 Regional constraints summary (By facility): January through September 2011 (See 2010 SOM, Table 7-17)	189
Table 7-20 Regional constraints summary (By facility): January through September 2010 (See 2010 SOM, Table 7-18)	189
Table 7-21 Congestion cost summary (By control zone): January through September 2011 (See 2010 SOM, Table 7-19)	190
Table 7-22 Congestion cost summary (By control zone): January through September 2010 (See 2010 SOM, Table 7-20)	191

SECTION 8 – FINANCIAL TRANSMISSION AND AUCTION REVENUE RIGHTS 193

Table 8-1 The FTR Auction Markets results were competitive.	193
Table 8-2 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through September 2011 (See 2010 SOM, Table 8-6)	197
Table 8-3 Daily FTR net position ownership by FTR direction: January through September 2011 (See 2010 SOM, Table 8-7)	197
Table 8-4 Monthly Balance of Planning Period FTR Auction market volume: January through September 2011 (See 2010 SOM, Table 8-11)	198
Table 8-5 Monthly Balance of Planning Period FTR Auction buy-bid bid and cleared volume (MW per period): January through September 2011 (See 2010 SOM, Table 8-12)	200
Table 8-6 Secondary bilateral FTR market volume: Planning periods 2010 to 2011 and 2011 to 2012 (See 2010 SOM, Table 8-13).	201
Table 8-7 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars per MWh): January through September 2011 (See 2010 SOM, Table 8-16)	202



TABLE OF CONTENTS

2011 Quarterly State of the Market Report for PJM: January through September

<i>Table 8-8 Monthly Balance of Planning Period FTR Auction revenue: January through September 2011 (See 2010 SOM, Table 8-19)</i>	<i>202</i>
<i>Table 8-9 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012 (See 2010 SOM, Table 8-20).</i>	<i>204</i>
<i>Table 8-10 Monthly FTR accounting summary (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012 through September 30, 2011 (See 2010 SOM, Table 8-21)</i>	<i>205</i>
<i>Table 8-11 FTR payout ratio by planning period (See 2010 SOM, Table 8-22).</i>	<i>206</i>
<i>Table 8-12 FTR profits by organization type and FTR direction: January through September 2011 (See 2010 SOM, Table 8-23)</i>	<i>207</i>
<i>Table 8-13 Monthly FTR profits by organization type: January through September 2011 (See 2010 SOM, Table 8-24).</i>	<i>207</i>
<i>Table 8-14 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2009, through September 30, 2011 (See 2010 SOM, Table 8-28)</i>	<i>208</i>

<i>Table 8-15 ARR revenue adequacy (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012 (See 2010 SOM, Table 8-30)</i>	<i>208</i>
<i>Table 8-16 ARR and self scheduled FTR congestion hedging by control zone: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Table 8-31)</i>	<i>210</i>
<i>Table 8-17 ARR and FTR congestion hedging by control zone: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Table 8-32).</i>	<i>211</i>
<i>Table 8-18 ARR and FTR congestion hedging: Planning periods 2010 to 2011 and 2011 to 2012 (See 2010 SOM, Table 8-33)</i>	<i>212</i>
<i>Table 8-19 ARRs and FTRs as a hedge against energy charges by control zone: January through September 2011 (See 2010 SOM, Table 8-34).</i>	<i>212</i>



FIGURES

SECTION 1 - INTRODUCTION..... 1

Figure 1-1 PJM's footprint and its 18 control zones	1
---	---

SECTION 2 – ENERGY MARKET, PART 1 13

Figure 2-1 Average PJM day-ahead aggregate supply curves: July through September, 2010 and 2011 (See 2010 SOM, Figure 2-1).....	19
Figure 2-2 Actual PJM footprint peak loads: July through September of 2003 to 2011 (See 2010 SOM, Figure 2-2)	19
Figure 2-3 PJM third quarter peak-load comparison: Thursday, July 21, 2011, and Tuesday, July 06, 2010 (See 2010 SOM, Figure 2-3).....	20
Figure 2-4 PJM hourly Energy Market HHI: January through September 2011 (See 2010 SOM, Figure 2-4).....	20
Figure 2-5 Frequently mitigated units and associated units (By month): February, 2006 through September, 2011 (New Figure)	24
Figure 2-6 Frequently mitigated units and associated units total months eligible: February, 2006 through September, 2011 (New Figure).....	24
Figure 2-7 PJM real-time accounting load histogram: January through September 2007 through 2011 (New Figure).....	25
Figure 2-8 PJM real-time average hourly load: Calendar years 2010 through September 2011 (See 2010 SOM, Figure 2-6).....	26
Figure 2-9 PJM day-ahead accounting load histogram: January through September 2007 through 2011 (New Figure).....	26
Figure 2-10 PJM day-ahead average load: Calendar years 2010 through September 2011 (See 2010 SOM, Figure 2-8).....	27
Figure 2-11 Day-ahead and real-time loads (Average hourly volumes): January through September 2011 (See 2010 SOM, Figure 2-9)	29
Figure 2-12 Difference between day-ahead and real-time loads (Average daily volumes): January 2010 through September 2011 (See 2010 SOM, Figure 2-10)	29
Figure 2-13 Day-ahead and real-time generation (Average hourly volumes): January through September 2011 (See 2010 SOM, Figure 2-11)	31
Figure 2-14 Difference between day-ahead and real-time generation (Average daily volumes): January 2010 through September 2011 (See 2010 SOM, Figure 2-12)	31
Figure 2-15 Price histogram for the PJM Real-Time Energy Market: January through September 2007 through 2011 (New Figure)	31
Figure 2-16 PJM real-time, monthly, load-weighted, average LMP: Calendar years 2007 through September 2011 (See 2010 SOM, Figure 2-14).....	33
Figure 2-17 Spot average fuel price comparison: Calendar years 2010 through September 2011 (See 2010 SOM, Table 2-15).....	33
Figure 2-18 Price histogram for the PJM Day-Ahead Energy Market: January through September 2007 through 2011 (New Figure)	33
Figure 2-19 Day-ahead, monthly, load-weighted, average LMP: Calendar years 2007 through September 2011 (See 2010 SOM, Table 2-17).....	35

Figure 2-20 Monthly volume of bid and cleared INC, DEC and Up-to Congestion bids (MW) January, 2005 through September, 2011 (New Figure)	37
Figure 2-21 PJM day-ahead aggregate supply curves: 2011 example day (See 2010 SOM, Figure 2-18)	40
Figure 2-22 Real-time load-weighted hourly LMP minus day-ahead load-weighted hourly LMP: January through September 2011 (See 2010 SOM, Figure 2-19)	42
Figure 2-23 Monthly simple average of real-time minus day-ahead LMP: January through September 2011 (See 2010 SOM, Figure 2-20).....	42
Figure 2-24 PJM system simple hourly average LMP: January through September 2011 (See 2010 SOM, Figure 2-21).....	42
Figure 2-25 Demand Response revenue by market: Calendar years 2002 through 2010 and January through September 2011 (See 2010 SOM, Figure 2-22).....	47
Figure 2-26 Economic Program payments by month: Calendar years 2007 through 2010 and January through September 2011 (See 2010 SOM, Figure 2-23).....	49

SECTION 3 - ENERGY MARKET, PART 2 55

Figure 3-1 New entrant CT real-time net revenue for January through September 2010 and 2011 and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year): (See 2010 SOM, Figure 3-3)	66
Figure 3-2 New entrant CT zonal real-time January through September 2011 net revenue by market and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year) (See 2010 SOM, Figure 3-4).....	67
Figure 3-3 New entrant CC real-time net revenue for January through September 2010 and 2011 and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Figure 3-6)	68
Figure 3-4 New entrant CC zonal real-time January through September 2011 net revenue by market and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year) (See 2010 SOM, Figure 3-7).....	68
Figure 3-5 New entrant CP real-time net revenue for January through March 2010 and 2011 and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year): January through September 2010 and 2011 (See 2010 SOM, Figure 3-9).....	69
Figure 3-6 New entrant CP zonal real-time January through September 2011 net revenue by market and 20-year levelized fixed cost as of 2010 (Dollars per installed MW-year) (See 2010 SOM, Figure 3-10).....	70
Figure 3-7 Average hourly real-time generation of wind units in PJM, January through September 2011 (See 2010 SOM, Figure 3-13)	77
Figure 3-8 Average hourly day-ahead generation of wind units in PJM, January through September 2011 (See 2010 SOM, Figure 3-14)	78
Figure 3-9 Marginal fuel at time of wind generation in PJM, January through September 2011 (See 2010 SOM, Figure 3-15).....	78



Figure 3-10 Spot monthly average emission price comparison: 2010 and 2011 (See 2010 SOM, Figure 3-16)	79
Figure 3-11 Operating reserve credits: January through September 2011 (See SOM 2010, Figure 3-22)	89
Figure 3-12 Average Cold Start plus Notification Time (Hours) of PJM offers: January through September 2011 (New Figure)	95

SECTION 4 - INTERCHANGE TRANSACTIONS 97

Figure 4-1 PJM real-time scheduled imports and exports: January through September 2011 (See 2010 SOM, Figure 4-1)	105
Figure 4-2 PJM day-ahead scheduled imports and exports: January through September 2011 (See 2010 SOM, Figure 4-2)	106
Figure 4-3 PJM real-time scheduled import and export transaction monthly volume history: 1999 through September 2011 (See 2010 SOM, Figure 4-3)	106
Figure 4-4 PJM day-ahead scheduled import and export transaction monthly volume history: June 2000 through September 2011 (New Figure)	106
Figure 4-5 PJM's footprint and its external interfaces (See 2010 SOM, Figure 4-4)	114
Figure 4-6 Figure 4-6 Real-time daily hourly average price difference (MISO Interface minus PJM/MISO): January through September 2011 (See 2010 SOM, Figure 4-5)	115
Figure 4-7 Day-ahead daily hourly average price difference (MISO interface minus PJM/MISO): January through September 2011 (See 2010 SOM, Figure 4-6)	115
Figure 4-8 Real-time daily hourly average price difference (NY proxy minus PJM/NYIS): January through September 2011 (See 2010 SOM, Figure 4-7)	116
Figure 4-9 Day-ahead daily hourly average price difference (NY proxy minus PJM/NYIS): January through September 2011 (See 2010 SOM, Figure 4-8)	116
Figure 4-10 PJM, NYISO and MISO real-time border price averages: January through September 2011 (See 2010 SOM, Figure 4-9)	117
Figure 4-11 PJM, NYISO and MISO day-ahead border price averages: January through September 2011 (See 2010 SOM, Figure 4-10)	117
Figure 4-12 Neptune hourly average flow: January through September 2011 (See 2010 SOM, Figure 4-11)	118
Figure 4-13 Linden hourly average flow: January through September 2011 (See 2010 SOM, Figure 4-12)	118
Figure 4-14 Credits for coordinated congestion management: January through September 2011 (See 2010 SOM, Figure 4-13)	119
Figure 4-15 Southwest actual and scheduled flows: January 2006 through September 2011 (See 2010 SOM, Figure 4-14)	120
Figure 4-16 Southeast actual and scheduled flows: January 2006 through September 2011 (See 2010 SOM, Figure 4-15)	120
Figure 4-17 Monthly up-to congestion cleared bids in MWh: January 2006 through September 2011 (See 2010 SOM, Figure 4-19)	121
Figure 4-18 Total settlements showing positive, negative and net gains for up-to congestion bids with a matching Real-Time Energy Market transaction: January through September 2011 (See 2010 SOM, Figure 4-20)	123

Figure 4-19 Total settlements showing positive, negative and net gains for up-to congestion bids without a matching Real-Time Energy Market transaction: January through September 2011 (See 2010 SOM, Figure 4-21)	123
Figure 4-20 Real-time interchange volume vs. average hourly LMP available for Duke and PEC imports: January through September 2011 (See 2010 SOM, Figure 4-22)	125
Figure 4-21 Real-time interchange volume vs. average hourly LMP available for Duke and PEC exports: January through September 2011 (See 2010 SOM, Figure 4-23)	125
Figure 4-22 Day-ahead interchange volume vs. average hourly LMP available for Duke and PEC imports: January through September 2011 (See 2010 SOM, Figure 4-24)	126
Figure 4-23 Day-ahead interchange volume vs. average hourly LMP available for Duke and PEC exports: January through September 2011 (See 2010 SOM, Figure 4-25)	127
Figure 4-24 Spot import service utilization: January 2009 through September 2011 (See 2010 SOM, Figure 4-27)	128

SECTION 5 – CAPACITY MARKET 129

Figure 5-1 History of capacity prices: Calendar year 1999 through 2014 (See 2010 SOM, Figure 5-1)	141
Figure 5-2 PJM equivalent outage and availability factors: January through September 2007 to 2011 (See 2010 SOM, Figure 5-4)	142
Figure 5-3 Generator performance factors: January through September 2011 (See 2010 SOM, Figure 5-10)	142
Figure 5-4 Trends in the PJM equivalent demand forced outage rate (EFORd): January through September 2007 to 2011 (See 2010 SOM, Figure 5-5)	143
Figure 5-5 Distribution of EFORd data by unit type: January through September 2011 (See 2010 SOM, Figure 5-6)	143
Figure 5-6 Contribution to EFORd by duty cycle: January through September 2007 to 2011 (See 2010 SOM, Figure 5-7)	144
Figure 5-7 Distribution of EFORd data by unit type: January through September 2011 (See 2010 SOM, Figure 5-8)	148
Figure 5-8 EFORd, XEFORd and EFORp: January through September 2011 (See 2010 SOM, Figure 5-9)	148

SECTION 6 - ANCILLARY SERVICE MARKETS 149

Figure 6-1 PJM Regulation Market HHI distribution: January through September 2011 (See 2010 SOM, Figure 6-1)	157
Figure 6-2 Off peak and on peak regulation levels: January through September, 2011 (See 2010 SOM, Figure 6-2)	158
Figure 6-3 PJM Regulation Market daily average market-clearing price, opportunity cost and offer price (Dollars per MWh): January through September, 2011 (See 2010 SOM, Figure 6-3)	159
Figure 6-4 Monthly average regulation demand (required) vs. price: January through September, 2011 (See 2010 SOM, Figure 6-4)	159



Figure 6-5 Monthly load weighted average regulation cost and price: January through September, 2011 (See 2010 SOM, Figure 6-5)	160
Figure 6-6 Mid-Atlantic Subzone average hourly Required synchronized reserve and Tier 2 scheduled: January through September, 2011 (See 2010 SOM, Figure 6-7)	164
Figure 6-7 Mid-Atlantic Subzone daily average hourly synchronized reserve required, Tier 2 MW scheduled, and Tier 1 MW estimated: January through September, 2011 (See 2010 SOM, Figure 6-8)	164
Figure 6-8 Tier 2 synchronized reserve average hourly offer volume (MW): January through September, 2011 (See 2010 SOM, Figure 6-9)	165
Figure 6-9 Average daily Tier 2 synchronized reserve offer by unit type (MW): January through September, 2011 (See 2010 SOM, Table 6-10)	165
Figure 6-10 PJM RFC Zone Tier 2 synchronized reserve scheduled MW: January through September, 2011 (See 2010 SOM, Figure 6-11)	166
Figure 6-11 Required Tier 2 synchronized reserve, Synchronized Reserve Market clearing price, and DSR percent of Tier 2: January through September, 2011 (See 2010 SOM, Figure 6-12)	167
Figure 6-12 Tier 2 synchronized reserve purchases by month for the Mid-Atlantic Subzone: January through September, 2011 (See 2010 SOM, Figure 6-13)	167
Figure 6-13 Impact of Tier 2 synchronized reserve added MW to the Mid-Atlantic Subzone: January through September, 2011 (See 2010 SOM, Figure 6-14)	168
Figure 6-14 Comparison of Mid-Atlantic Subzone Tier 2 synchronized reserve load weighted average price and cost (Dollars per MW): January through September, 2011 (See 2010 SOM, Figure 6-15)	168
Figure 6-15 Hourly components of DASR clearing price: January through September 2011 (New Figure)	170

SECTION 8 – FINANCIAL TRANSMISSION AND AUCTION REVENUE RIGHTS 193

Figure 8-1 Annual and Monthly FTR Auction bid and cleared volume: June 2003 through September 2011 (New Figure)	201
Figure 8-2 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Figure 8-7)	204
Figure 8-3 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Figure 8-8)	204
Figure 8-4 Original FTR payout ratio with adjustments by month, excluding excess revenue distribution: January 2004 to September 2011 (New Figure)	206
Figure 8-5 FTR payout ratio by month: June 2003 to September 2011 (See 2010 SOM, Figure 8-9)	206
Figure 8-6 Ten largest positive and negative FTR target allocations summed by sink: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Figure 8-10)	206
Figure 8-7 Ten largest positive and negative FTR target allocations summed by source: Planning period 2011 to 2012 through September 30, 2011 (See 2010 SOM, Figure 8-11)	207
Figure 8-8 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 through September 30, 2011 (See 2010 SOM, Figure 8-12)	209

