ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
Ancillary Services Payments (Amount Due = -1 * Billable Quantity * Price)											
1	0001	Day Ahead Spinning Reserve due SC	Spinning Reserve accepted bid quantity [per SC, per location]	MW-hr	Price = Max (Bid price, DA Zonal Spinning Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
2	0051	Hour Ahead Spinning Reserve due SC	Hour-Ahead additional Spinning Reserve accepted bid quantity [per SC, per location]	MW-hr	Price = Max (Bid price, HA Zonal Spinning Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
3	0002	Day Ahead Non-Spinning Reserve due SC	Non-Spinning Reserve Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, DA Zonal Non Spinning Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
4	0052	Hour Ahead Non-Spinning Reserve due SC	Hour-Ahead additional Non-Spinning Reserve accepted bid quantity [per SC, per location]	MW-hr	Price = Max (Bid price, HA Zonal Non Spinning Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
Ret	0003	Day Ahead AGC/Regulation due SC	AGC/Regulation Accepted Bid Quantity [per SC, per location] (Sum of Absolute Positive & Negative Bid Qty)	MW-hr	Non-FERC Locations: Zonal AGC/Regulation Capacity Market Clearing Price for Trading Interval FERC Locations: AGC/Regulation Capacity Price for generation unit	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0053	Hour Ahead AGC/Regulation due SC	Hour-Ahead additional AGC/Regulation accepted bid quantity [per SC, per location] (Sum of Absolute Positive & Negative Bid Qty)	MW-hr	Non-FERC Locations: Zonal AGC/Regulation Capacity Market Clearing Price for Trading Interval FERC Locations: AGC/Regulation Capacity Price for generation unit	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	8/17/99
5	0004	Day Ahead Replacement Reserve due SC	Replacement Reserve Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, DA Zonal Replacement Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
6	0054	Hour Ahead Replacement Reserve due SC	Hour-Ahead additional Replacement Reserve accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, HA Zonal Replacement Reserve MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	4/1/98	Open
7	0005	Day Ahead Regulation Up due SC	Day Ahead Regulation Up Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, DA Zonal Regulation Up MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	8/18/99	Open
8	0055	Hour Ahead Regulation Up due SC	Hour Ahead Regulation Up Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, HA Zonal Regulation Up MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	8/18/99	Open
9	0006	Day Ahead Regulation Down due SC	Day Ahead Regulation Down Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, DA Zonal Regulation Down MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	8/18/99	Open
10	0056	Hour Ahead Regulation Down due SC	Hour Ahead Regulation Down Accepted Bid Quantity [per SC, per location]	MW-hr	Price = Max (Bid price, HA Zonal Regulation Down MCP)	$/MW-hr	Amt = -BQ*P	Hourly	Y	8/18/99	Open

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS: Billable Quantity (BQ)	Units	Price (P)	Units	Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period: Start	End
Ancillary Services Costs Allocation (Amount Due = Billable Quantity * Price)											
Ret	0101	Day Ahead Spinning Reserve due ISO	Non Self-Provided Spinning Reserve Requirement [per SC, per zone]	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Non Self-Provided Spinning Reserve Requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0151	Hour Ahead Spinning Reserve due ISO	Hour-Ahead additional Non-Self Provided Spinning Reserve requirement [per SC, per zone]	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Hour-Ahead additional Non Self-Provided Spinning Reserve Requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0102	Day Ahead Non-Spinning Reserve due ISO	Non Self-Provided Non-Spinning Reserve Requirement [per SC, per zone]	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Non Self-Provided Non-Spinning Reserve Requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0152	Hour Ahead Non-Spinning Reserve due ISO	Hour-Ahead additional Non-Self Provided Non-Spinning Reserve requirement [per SC, per zone]	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Hour-Ahead additional Non-Self Provided AGC/Regulation requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0103	Day Ahead AGC/Regulation due ISO	Non-Self Provided AGC/Regulation requirement [per SC, per zone] (Sum of Absolute Positive & Negative Bid Qty)	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Non-Self Provided AGC/Regulation requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0153	Hour Ahead AGC/Regulation due ISO	Hour-Ahead Non-Self Provided additional AGC/Regulation requirement [per SC, per zone]	MW-hr	average MCP = {∑ [(MCP * Billable QuantityNon-FERC) + (Bid Price * Billable QuantityFERC)]} / ∑ (Hour-Ahead additional Non-Self Provided AGC/Regulation requirement)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
Ret	0303	Replacement Reserve due ISO (Dispatched)	$R.R._{dispatched}$	MW-hr	average MCP = {∑ [(Capacity MCP * Capacity Billable QuantityNon-FERC) + (Capacity Bid Price * Capacity Billable QuantityFERC)]} / ∑ (Capacity Billable QuantityNon-FERC + Capacity Billable QuantityFERC)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
			$R.R._{dispatched}$ = Dispatched Qty * {SC[MAX(0,imbalance)] * [SC Non-Self Provided Replacement Reserve Req/ ∑ (SC Non-Self Provided Replacement Reserve Req)] / ∑[Total SC[MAX(0,imbalance)] * (SC Non-Self Provided Req/∑(SC Non Self Provided Replacement Res. Req))]}								
Ret	0304	Replacement Reserve due ISO (Undispatched)	$R.R._{undispatched}$	MW-hr	average MCP = {∑ [(Capacity MCP * Capacity Billable QuantityNon-FERC) + (Capacity Bid Price * Capacity Billable QuantityFERC)]} / ∑ (Capacity Billable QuantityNon-FERC + Capacity Billable QuantityFERC)	$/MW-hr	Amt = BQ*P	Hourly	Y	4/1/98	8/17/99
			$R.R._{undispatched}$ = Undispatched Qty * [SC scheduled nonself provided Replacement Reserve Requirement / Total SC scheduled non-self provided Replacement Reserve Requirement]								
11	0111	Spinning Reserve due ISO	Net Reserve Obligation [per SC, per zone]	MW-hr	Price = (DAQ*DAP + HAQ*HAP) / (DAQ + HAQ) where DAQ = DA procurement target in DA region HAQ = Incremental HA procurement target in the zones that make up the DA region DAP = Average procurement price in the DA region HAP = Average procurement price in the zones that make up the DA region	$/MW-hr	Amt = BQ*P	Hourly	Y	8/18/99	Open
			Net Zonal Obligation = Net Regional obligation * (Zonal SC Metered Demand / Regional SC Metered Demand)								

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
12	0112	Non-Spinning Reserve due ISO	Net Reserve Obligation [per SC, per zone]	MW-hr	Price = (DAQ*DAP + HAQ*HAP) / (DAQ + HAQ) where DAQ = DA procurement target in DA region HAQ = Incremental HA procurement target in the zones that make up the DA region DAP = Average procurement price in the DA region HAP = Average procurement price in the zones that make up the DA region	$/MW-hr	Amt = BQ*P	Hourly	Y	8/18/99	Open
			Net Zonal Obligation = Net Regional obligation * (Zonal SC Metered Demand / Regional SC Metered Demand)								
13	0114	Replacement Reserve due ISO	Net Reserve Obligation [per SC, per zone]	MW-hr	Price = (DAQ*DAP + HAQ*HAP - $RRWC) / (DAQ + HAQ) where DAQ = DA procurement target in DA region HAQ = Incremental HA procurement target in the zones that make up the DA region DAP = Average procurement price in the DA region HAP = Average procurement price in the zones that make up the DA region $RRWC = Charges collected by ISO (in CTs 24 and 124) due to dispatch of Replacement Reserves in DA region	$/MW-hr	Amt = BQ*P	Hourly	Y	8/18/99	Open
			Net Zonal Obligation = Net Regional obligation * (Zonal SC Metered Load / Regional SC Metered Load) Net Regional Obligation = Base Obligation + Remaining Obligation + Inter SC Trades - Effective Self Provision Base Obligation = Min (Deviation Requirement, Prorata share based on SCs' Deviation Requirements of Reserve Available to ISO) Deviation Requirement = Overscheduled Generation + Underscheduled Load Remaining Obligation = (Reserve Available to ISO - ΣBase Obligation) * (SC Regional Metered Load / Total Regional Metered Load)								
14	0115	Regulation Up Due ISO	Net Reserve Obligation [per SC, per zone]	MW-hr	Price = (DAQ*DAP + HAQ*HAP) / (DAQ + HAQ) where DAQ = DA procurement target in DA region HAQ = Incremental HA procurement target in the zones that make up the DA region DAP = Average procurement price in the DA region HAP = Average procurement price in the zones that make up the DA region	$/MW-hr	Amt = BQ*P	Hourly	Y	8/18/99	Open
			Net Zonal Obligation = Net Regional obligation * (Zonal SC Metered Load / Regional SC Metered Load)								
15	0116	Regulation Down Due ISO	Net Reserve Obligation [per SC, per zone]	MW-hr	Price = (DAQ*DAP + HAQ*HAP) / (DAQ + HAQ) where DAQ = DA procurement target in DA region HAQ = Incremental HA procurement target in the zones that make up the DA region DAP = Average procurement price in the DA region HAP = Average procurement price in the zones that make up the DA region	$/MW-hr	Amt = BQ*P	Hourly	Y	8/18/99	Open
			Net Zonal Obligation = Net Regional obligation * (Zonal SC Metered Load / Regional SC Metered Load)								
Withholding of Dispatched Replacement Reserve Capacity Payment (Amount Due = Billable Quantity * Price)											

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
16	0024	Dispatched Replacement Reserve (Bid-In) Capacity Withhold	Amount of 'bid-in' Replacement Reserve capacity that has been dispatched by ISO [per SC, per location]	MW-hr	Weighted average Replacement Reserve price (RRBPih) received by the resource in that hour for its 'bid-in' Capacity	$/MW-hr	Amt = BQ*P	Hourly	Y	8/1/01	Open
			Withholding of RR payment for Bid-in service is calculated as follows: $BIWCih = BIWCih * RRBPih BIWCih = min (BICih, TRR'ih) TRR'ih = ERR'ih + OOSRR'ih where $BIWCih is the charge (in $) for resource i in hour h due to the dispatch of bid-in RR capacity. BIWCih is the withheld capacity amount (in MW-hr) for resource i in hour h due to dispatch of bid-in RR capacity. RRBPih is the weighted average RR price received by the resource i in hour h for its bid-in capacity. BICih is the bid-in RR capacity for resource i in hour h. TRR'ih is the total amount of Instructed Energy that originates from the RR bid-in capacity of resource i in hour h. ERR'ih is the BEEP Instructed Energy that originates from the RR bid-in capacity of resource i in hour h. OOSRR'ih is the OOS Instructed Energy that originates from the RR bid-in capacity of resource i in hour h.								
17	0124	Dispatched Replacement Reserve (Self-Provided) Capacity Withhold	Amount of Excess Self-Provided Replacement Reserve capacity that has been dispatched by ISO [per SC, per region]	MW-hr	User Rate for Replacement Reserve in the Region (i.e. price for CT 114)	$/MW-hr	Amt = BQ*P	Hourly	Y	8/1/01	Open
			Withholding of RR payment for Excess Self-Provided service is calculated as follows: $SPWCjrh = SPWCjrh * RRUPrh SPRR'ih = TRR'ih – BIWCih SPRR'jrh = Σi SPRR'ih SPWCjrh = min (SPRR'jrh, ESPjrh, RRCjrh) RRCjrh = -1 * min(0, RROjrh) where $SPWCjrh is the charge (in $) for SC j in region r and hour h due to the dispatch of Self-Provided RR capacity. SPWCjrh is the withheld capacity amount (in MW-hr) for SC j in region r and hour h due to the dispatch of Self-Provided RR capacity. RRUPrh is the user rate for RR in region r and hour h. SPRR'ih is the amount of Instructed Energy that originates from Self-Provided RR capacity of resource i in hour h. For TRR'ih, BIWCih, please see definitions under CT 0024. SPRR'jrh is the total amount of Instructed Energy that originates from SC j's Self-Provided RR capacity in region r and hour h. ESPjrh is the SC j's Effective Self Provision of RR in region r and hour h. RRCjrh is the SC j's credit (in MW-hr) due to excess Self-Provision or inter-SC trades of RR in region r and hour h. RROjrh is the SC j's net RR obligation (in MW-hr) in region r and hour h.								
A/S Rational Buyer Settlement			(Amount Due = -1 * Billable Quantity * Price)								

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
18	1011	Ancillary Service Rational Buyer Adjustment	SC's user payment for Ancillary Services [per SC, per Control Area]	$	Per Unit Price = Total overcollected or undercollected revenue / Total collected user payments for Ancillary Services.	$/$	Amt = -BQ*P	Hourly	Y	8/18/99	Open
RMR Preempted Ancillary Service Capacity Settlements (Amount Due = Billable Quantity * Price)											
19	0061	Hour Ahead RMR Preemption of Spinning Reserve (HA Price)	Amount of Spinning Reserve Pre-empted before close of HA Market [per SC, per location]	MW-hr	Zonal Spinning Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly	Y	1/1/00	Open
20	0062	Hour Ahead RMR Preemption of Non-Spinning Reserve (HA Price)	Amount of Non-Spinning Reserve Pre-empted before close of HA Market [per SC, per location]	MW-hr	Zonal Non Spinning Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly	Y	1/1/00	Open
21	0064	Hour Ahead RMR Preemption of Replacement Reserve (HA Price)	Amount of Replacement Reserve Pre-empted before close of HA Market [per SC, per location]	MW-hr	Zonal Replacement Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly	Y	1/1/00	Open
22	0065	Hour Ahead RMR Preemption of Regulation Up (HA Price)	Amount of Regulation Up Pre-empted before close of HA Market [per SC, per location]	MW-hr	Zonal Regulation Up Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly	Y	1/1/00	Open
23	0066	Hour Ahead RMR Preemption of Regulation Down (HA Price)	Amount of Regulation Down Pre-empted before close of HA Market [per SC, per location]	MW-hr	Zonal Regulation Down Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly	Y	1/1/00	Open
24	0071	Real Time RMR Preemption of Spinning Reserve (DA Price)	Amount of Spinning Reserve Pre-empted after close of Hour Ahead Market at Day Ahead Price [per SC, per location]	MW-hr	Zonal Spinning Reserve Capacity Day Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
25	0072	Real Time RMR Preemption of Non-Spinning Reserve (DA Price)	Amount of Non-Spinning Reserve Pre-empted after close of Hour Ahead Market at Day Ahead Price [per SC, per location]	MW-hr	Zonal Non-Spinning Reserve Capacity Day Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
26	0074	Real Time RMR Preemption of Replacement Reserve (DA Price)	Amount of Replacement Reserve Pre-empted after close of Hour Ahead Market at Day Ahead Price [per SC, per location]	MW-hr	Zonal Replacement Reserve Capacity Day Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
27	0075	Real Time RMR Preemption of Regulation Up (DA Price)	Amount of Regulation Up Pre-empted after close of Hour Ahead Market at Day Ahead Price [per SC, per location]	MW-hr	Zonal Regulation Up Capacity Day Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open

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REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
28	0076	Real Time RMR Preemption of Regulation Down (DA Price)	Amount of Regulation Down Pre-empted after close of Hour Ahead Market at Day Ahead Price [per SC, per location]	MW-hr	Zonal Regulation Down Capacity Day Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
29	0081	Real Time RMR Preemption of Spinning Reserve (HA Price)	Amount of Spinning Reserve Pre-empted after close of Hour Ahead Market at Hour Ahead Price [per SC, per location]	MW-hr	Zonal Spinning Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
30	0082	Real Time RMR Preemption of Non-Spinning Reserve (HA Price)	Amount of Non-Spinning Reserve Pre-empted after close of Hour Ahead Market at Hour Ahead Price [per SC, per location]	MW-hr	Zonal Non-Spinning Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
31	0084	Real Time RMR Preemption of Replacement Reserve (HA Price)	Amount of Replacement Reserve Pre-empted after close of Hour Ahead Market at Hour Ahead Price [per SC, per location]	MW-hr	Zonal Replacement Reserve Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
32	0085	Real Time RMR Preemption of Regulation Up (HA Price)	Amount of Regulation Up Pre-empted after close of Hour Ahead Market at Hour Ahead Price [per SC, per location]	MW-hr	Zonal Regulation Up Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
33	0086	Real Time RMR Preemption of Regulation Down (HA Price)	Amount of Regulation Down Pre-empted after close of Hour Ahead Market at Hour Ahead Price [per SC, per location]	MW-hr	Zonal Regulation Down Capacity Hour Ahead Market Clearing Price for Trading Interval	$/MW-hr	Amt = BQ*P	Hourly 10-Minute	Y	1/1/2000 6/1/2000	5/31/2000 Open
RMR Preemption Revenues Allocation (Amount Due = -1 * Billable Quantity * Price)											
34	1061	Distribution of Preempted Spinning Reserve	SC's Metered Demand[5] [per SC, per Zone]	MWh	Total Spinning Reserve Preemption Revenue / SCs' Total Metered Demand [per A/S Region, per Trading Interval]	$/MWh	Amt = -BQ*P	Hourly	Y	6/1/00	Open
35	1062	Distribution of Preempted Non-Spinning Reserve	SC's Metered Demand[5] [per SC, per Zone]	MWh	Total Spinning Reserve Preemption Revenue / SCs' Total Metered Demand [per A/S Region, per Trading Interval]	$/MWh	Amt = -BQ*P	Hourly	Y	6/1/00	Open
36	1064	Distribution of Preempted Replacement Reserve	SC's Metered Demand[5] [per SC, per Zone]	MWh	Total Spinning Reserve Preemption Revenue / SCs' Total Metered Demand [per A/S Region, per Trading Interval]	$/MWh	Amt = -BQ*P	Hourly	Y	6/1/00	Open

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REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
37	1065	Distribution of Preempted Regulation Up	SC's Metered Demand[5] [per SC, per Zone]	MWh	Total Spinning Reserve Preemption Revenue / SCs' Total Metered Demand [per A/S Region, per Trading Interval]	$/MWh	Amt = -BQ*P	Hourly	Y	6/1/00	Open
38	1066	Distribution of Preempted Regulation Down	SC's Metered Demand[5] [per SC, per Zone]	MWh	Total Spinning Reserve Preemption Revenue / SCs' Total Metered Demand [per A/S Region, per Trading Interval]	$/MWh	Amt = -BQ*P	Hourly	Y	6/1/00	Open
RMR Imbalance Energy Payment Withhold											
39	0410	Unscheduled RMR Energy	Energy generated in excess of scheduled energy, up to RMR dispatched amount [per SC, per location]	MWh	Price = Withhold Amount / Billable Quantity Withhold Amount is first taken from the Instructed Energy payment (at the Average Price for the instructed energy in the trading interval) and then from the Uninstructed Energy (at the Decremental MCP of the interval) of the unit.	$/MWh	P = Amt / BQ	Hourly 10-Minute	Y	6/1/2000 9/1/2000	8/31/2000 Open
Intra-Zonal Congestion Settlements											
40	0201	Day-Ahead Intra-Zonal Congestion Incs/Decs Settlement	Accepted Day-Ahead Incremental / Decremental Bid Quantity	MWh	Bid Price	$/MWh	Amt = -BQ*P	Hourly	N/A	Future	Open
41	0202	Day-Ahead Intra-Zonal Congestion Charge/Refund (DA Grid Operations Charge)	Sum of SC Scheduled Load & Export for Zone for Trading Interval	MWh	Intra-Zonal Congestion Charge Price = Sum All SC's Day-Ahead Intra-Zonal Congestion Settlements (inc/decs) for Zone for Trading Interval / Total MW Load + Exports Energy in the Zone for Trading Interval	$/MWh	Amt = BQ*P	Hourly	N/A	Future	Open
42	0251	Hour-Ahead Intra-Zonal Congestion Incs/Decs Settlement	Accepted Revised Hour-Ahead Incremental/Decremental Bid Quantity	MWh	Bid Price	$/MWh	Amt = -BQ*P	Hourly	N/A	Future	Open
43	0252	Hour-Ahead Intra-Zonal Congestion Charge/Refund (HA Grid Operations Charge)	Absolute difference between [(the Sum of Hour-Ahead Scheduled Load & Export) minus (the sum of Day-Ahead Scheduled Load & Export)]	MWh	Intra-Zonal Congestion Charge Price = Sum All SC's Hour-Ahead Intra-Zonal Congestion Incs/Decs Settlements for Zone for Trading Interval / The Sum of all SCs Billable quantities	$/MWh	Amt = BQ*P	Hourly	N/A	Future	Open
Inter-Zonal Congestion Settlements											
44	0203	Day-Ahead Inter-Zonal Congestion Settlement	SC's Day-Ahead net New Firm Use (NFU) import into a Zone [per SC, per Zone]	MWh	Price = Day-Ahead Zonal MCP (Reference Price, λ)	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	Open

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
45	0204	Day-Ahead Inter-Zonal Congestion Refund due TO	SC's (TO or FTR Owner) Percentage Entitlement on Branch Group * Branch Group NFU loading [per SC, per Branch Group]	MWh	Price = Day-Ahead Congestion Price of Branch Group (Shadow Price, μ)	$/MWh	Amt = -BQ*P	Hourly	Y	4/1/98	Open
46	0253	Hour-Ahead Inter-Zonal Congestion	SC's Hour-Ahead additional New Firm Use (NFU) import into a Zone [per SC, per Zone]	MWh	Price = Hour-Ahead Zonal MCP (Reference Price, λ)	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	Open
47	0254	Hour-Ahead Inter-Zonal Congestion Refund due TO	SC's (TO or FTR Owner) Percentage Entitlement on Branch Group * Increase in Branch Group NFU loading from Day-Ahead to Hour-Ahead [per SC, per Branch Group]	MWh	Price = Hour-Ahead Congestion Price of Branch Group location (Shadow Price, μ)	$/MWh	Amt = -BQ*P	Hourly	Y	4/1/98	Open
48	0255	Hour-Ahead Inter-Zonal Congestion Debit to TOs	SC's (TO or FTR Owner) Percentage Entitlement on Branch Group * Decrease in Branch Group NFU loading from Dayahead to Hourahead [per SC, per Branch Group]	MWh	Price = Day-Ahead Congestion Price of Branch Group (Shadow Price, m)	$/MWh	Amt = BQ*P	Hourly	Y	3/18/99	Open
49	0256	Hour-Ahead Inter-Zonal Congestion Debit to SCs	SC's Day-Ahead Path Utilization in the Congested Direction [per SC, per Branch Group]	MWh	Price = {[DA Path Loading - HA Path Loading] * HA Congestion Price - TO Debit Amount for Path} / Total DA Path Flow in the Congested Direction	$/MWh	Amt = BQ*P	Hourly	Y	3/18/99	Open
ISO Administrative Charges (Amount Due = Billable Quantity * Price)											
Ret	0351	Monthly Grid Management Charge due ISO	SC Measured Load plus Gross Export in the Control Area [per SC]	MWh	ISO Administrative Charge Price	$/MWh	Amt = BQ*P	Monthly	Y	4/1/98	12/31/00
50	0521	GMC-Control Area Services	SC metered Gross Load and real time gross export [per SC]	MWh	Control Area Service Charge Price	$/MWh	Amt = BQ*P	Monthly	Y	1/1/01	Open

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
51	0522	GMC-Congestion Management	Aggregate of the absolute values of the hourly net scheduled inter-zonal New Firm Use flows [per SC]	MWh	Inter-Zonal Scheduling Charge Price	$/MWh	Amt = BQ*P	Monthly	Y	1/1/01	Open
52	0523	Market Operations Grid Management Charge	Aggregate of the absolute values of the hourly purchases/sales of Ancillary Services and 10-Minute Imbalance Energy [per SC]	MW-hr	Market Operations Charge Price	$/MW-hr	Amt = BQ*P	Monthly	Y	1/1/01	12/31/01
53	0524	GMC-A/S and RT Energy Operations	Aggregate of the absolute values of the following: hourly purchases/sales of Ancillary Services, 50% of Effective Self Provision, and 10-Minute Imbalance Energy [per SC]	MW-hr	Rate of A/S and Real Time Energy Operations Charge	$/MW-hr	Amt = BQ*P	Monthly	Y	1/1/02	Open
Market Uplifts (Amount Due = Billable Quantity * Price)											
54	0591	Emissions Cost Recovery	SC in-state metered Load (consists of metered load within ISO Control Area and real time gross export to other in-state Control Areas) [per SC]	MWh	Emissions Cost Recovery Rate (Published by ISO)	$/MWh	Amt = BQ*P	Monthly	Y	6/21/01	Open
55	0592	Start-Up Cost Recovery	SC in-state metered Load (consists of metered load within ISO Control Area and real time gross export to other in-state Control Areas) [per SC]	MWh	Start-Up Cost Recovery Rate (Published by ISO)	$/MWh	Amt = BQ*P	Monthly	Y	6/21/01	Open
Market Uplifts Due Trustee (Amount Due = -1 * Billable Quantity * Price)											
56	0593	Emissions Cost Due Trustee	Total in-state metered Load (consists of metered load within ISO Control Area and real time gross export to other in-state Control Areas)	MWh	Emissions Cost Recovery Rate (Published by ISO)	$/MWh	Amt = -BQ*P	Monthly	Y	6/21/01	Open
57	0594	Start-Up Cost Due Trustee	Total in-state metered Load (consists of metered load within ISO Control Area and real time gross export to other in-state Control Areas)	MWh	Start-Up Cost Recovery Rate (Published by ISO)	$/MWh	Amt = -BQ*P	Monthly	Y	6/21/01	Open
TAC/Wheeling Charges (Amount Due = Billable Quantity * Price)											

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
Ret	0352	Wheeling Out / Wheeling Through due ISO	Expost Gross Export Schedule at an Exit Point	MWh	TO Tariff at Exit Point or TO Weighted Tariff Rate at the Point (if Multiple Owners exist)	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	12/31/00
58	0382	High Voltage Wheeling Charge due ISO	Real time gross export excluding amounts exempted due to ETCs [per SC, per location]	MWh	High Voltage Wheeling Access Rate at exit location (= TAC Area rate, or weighted TAC Area rate if there are multiple owners from different TAC areas)	$/MWh	Amt = BQ*P	Monthly	Y	1/1/01	Open
59	0383	Low Voltage Wheeling Charge due ISO	Real time gross export excluding amounts exempted due to ETCs [per SC, per location]	MWh	Low Voltage Wheeling Access Rate at exit location (= Owner's Low Voltage Access rate, or weighted Low Voltage Access rate if there are multiple owners)	$/MWh	Amt = BQ*P	Monthly	Y	1/1/01	Open
Wheeling Revenues Allocation (Amount Due = -1 * Billable Quantity * Price)											
Ret	0354	Wheeling Charge Refund due TO	Expost Gross Export at the Exit Point for all BA * TO Percentage Revenue Requirement [per TO, per location]	MWh	Individual TO Tariff Rate at the Exit Point	$/MWh	Amt = -BQ*P	Hourly	Y	4/1/98	12/31/00
60	0384	High Voltage Wheeling Revenue due TO	(Real time gross export excluding amounts exempted due to ETCs * TO allocation percentage) [per TO, per location]	MWh	High Voltage Wheeling Access Rate at exit location (= TAC Area rate, or weighted TAC Area rate if there are multiple owners from different TAC areas)	$/MWh	Amt = -BQ*P	Monthly	Y	1/1/01	Open
61	0385	Low Voltage Wheeling Revenue due TO	(Real time gross export excluding amounts exempted due to ETCs * TO allocation percentage) [per TO, per location]	MWh	Low Voltage Wheeling Access Rate at exit location (= Owner's Low Voltage Access rate, or weighted Low Voltage Access rate if there are multiple owners)	$/MWh	Amt = -BQ*P	Monthly	Y	1/1/01	Open
Per Unit Charges (Amount Due = Billable Quantity * Price)											
62	1010	Neutrality Adjustments	SC's Metered Demand[5] in the Control Area [Per SC]	MWh	Per Unit Price = Total Amount / Total Metered Demand in the Control Area	$/MWh	Amt = BQ*P	Hourly 10-Minute	Y	4/1/98 9/1/00	8/31/00 Open
63	1999	Rounding Adjustment	SC's Metered Demand[5] in the Control Area [Per SC]	MWh	Per Unit Price = Total Amount / Total Metered Demand in the Control Area	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	Open
Instructed Energy Settlements											
Ret	0301	A/S Energy And Supplemental Energy due SC	Ex-Post A/S (Bid in and self provided) Energy and Supplemental Energy Quantity [per SC, per location]	MWh / trading interval	Effective Price = -1 * Amount Due / Billable Quantity	$/MWh	P = -Amt / BQ	Hourly	Y	4/1/98	8/31/00

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
64	0401	Instructed Energy	Energy delivered in excess of schedule in accordance with ISO instructions [per SC, Per Location/Interchange]. Instructed energy is settled in the following sequence: 1) Ramping Energy; 2) Negative Out of stack and Supplemental Energy; 3) Out of stack Energy in chronological order (first-come, first-settled); 4) Supplemental Energy; 5) Energy out of Replacement Reserve; 6) Energy out of Non-Spinning Reserve; 7) Energy out of Spinning Reserve; 8) Residual Imbalance Energy.	MWh / trading interval	-1 * Amount Due = (Ramping Energy * 0) + (+ve Suppl. Imbal. Energy * INC MCP) + (-ve Suppl. Imbal. Energy * DEC MCP) + ((Imbal. Energy from Spin + Imbal. Energy from Non Spin + Imbal. Energy from RR) * INC MCP) + (+ve Out of stack Energy * min(INC MCP, OOS Price)) + (-ve Out of stack Energy * OOS Price) + (Positive Residual Imbal Energy * INC MCP_r) + (Negative Residual Imbal. Energy * DEC MCP_r) where MCPr is the Market Clearing Price of the Price Reference Interval Price = -1 * Amount Due / Billable Quantity	$/MWh	P = -Amt / BQ	10-Minute	Y	9/1/00	Open

The following notations are used in the equations below.

$_i$ = Resource, $_h$ = Hour, $_k$ = Interval in an hour, $_l$ = Instruction sequence index $_r$ = Congestion Region

$^+$ = Incremental, $^-$ = Decremental, $'$ = Delivered,

$S_{i,h,k}$ = Scheduled Energy; $M_{i,h,k}$ = Metered Quantity;

$RE_{i,h,k}$ = Ramping Energy; Ramping energy is only calculated for ISO Metered Entities. $RE_{i,h,k}$ = 0 for Non Metered Entities.

$GMM_{a,i,h}$ = Actual Generator Meter Multiplier; $GMM_{f,i,h}$ = Forecast Generator Meter Multiplier;

$ESE^{+}_{i,h,k}$ = Acknowledged Incremental Supplemental Energy; $ESE^{-}_{i,h,k}$ = Acknowledged Decremental Supplemental Energy;

$ESE^{'+}_{i,h,k}$ = Delivered Incremental Supplemental Energy; $ESE^{'-}_{i,h,k}$ = Delivered Decremental Supplemental Energy;

$ESR_{i,h,k}$ = Acknowledged Energy from Spin Reserve; $ESR'_{i,h,k}$ = Delivered Energy from Spin Reserve;

$ENS_{i,h,k}$ = Acknowledged Energy from Non Spin Reserve; $ENS'_{i,h,k}$ = Delivered Energy from Non Spin Reserve;

$ERR_{i,h,k}$ = Acknowledged Energy from Repl. Reserve; $ERR'_{i,h,k}$ = Delivered Energy from Repl. Reserve;

$RIE_{i,h,k}$ = Residual Imbalance Energy of Resource; $RIE'_{i,h,k}$ = Produced or Consumed Residual Imbalance Energy;

$OOS^{+}_{i,h,k,l}$ = Acknowledged Positive Out of Stack Energy; $OOS^{'+}_{i,h,k,l}$ = Delivered Positive Out of Stack Energy;

$OOS^{-}_{i,h,k,l}$ = Acknowledged Negative Out of Stack Energy; $OOS^{'-}_{i,h,k,l}$ = Delivered Negative Out of Stack Energy;

For Generator, the total generation deviation is:

$$E_{i,h,k} = M_{i,h,k} * GMM_{a,i,h} - S_{i,h,k} * GMM_{f,i,h}$$

For Load, the total load deviation is:

$$E_{i,h,k} = S_{i,h,k} - M_{i,h,k}$$

$GMM_{aih} = 1$, $ESR_{i,h,k} = 0$, $ESR'_{i,h,k} = 0$

For Import, $OOS^{'+}_{i,h,k}$, $OOS^{'-}_{i,h,k}$, $ESE^{'+}_{i,h,k}$, $ESE^{'-}_{i,h,k}$, $ERR'_{i,h,k}$, $ENS'_{i,h,k}$ and $ESR'_{i,h,k}$ will be determined directly based on communications with the SC and the neighbor Control Areas.

There is no Instructed Energy for Export resources.

$$E^{(1)}_{i,h,k} = E_{i,h,k} - RE_{i,h,k}$$

If ($\Sigma OOS^{+}_{i,h,k,l} + ESE^{+}_{i,h,k} + ESR_{i,h,k} + ENS_{i,h,k} + ERR_{i,h,k} > 0$) and ($\Sigma OOS^{-}_{i,h,k,l} + ESE^{-}_{i,h,k} < 0$) Then

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS: Billable Quantity (BQ)	Units	Price (P)	Units	Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period: Start	End
			$OOS^{'-}_{i,h,k,l} = OOS^{-}_{i,h,k,l}$ $ESE^{'-}_{i,h,k} = ESE^{-}_{i,h,k}$ $E^{(2)}_{i,h,k} = E^{(1)}_{i,h,k} - \Sigma OOS^{'-}_{i,h,k,l} * GMM_{a,i,h} - ESE^{'-}_{i,h,k}$ $E^{(2,0)}_{i,h,k} = E^{(2)}_{i,h,k}$ $OOS^{'+}_{i,h,k,l} = \{\min[OOS^{+}_{i,h,k,l} * GMM_{a,i,h}, \max(0, E^{(2,l-1)}_{i,h,k})]\} / GMM_{a,i,h}$ for all OOS Instructions Sequence 1 through L $E^{(2,l)}_{i,h,k} = E^{(2,l-1)}_{i,h,k} - OOS^{'+}_{i,h,k,l} * GMM_{a,i,h}$ for all OOS Instructions Sequence 1 through L $E^{(3)}_{i,h,k} = E^{(2,L)}_{i,h,k}$ Otherwise $E^{(1,0)}_{i,h,k} = E^{(1)}_{i,h,k}$ $OOS^{'+}_{i,h,k,l} = \{\min[OOS^{+}_{i,h,k,l} * GMM_{a,i,h}, \max(0, E^{(1,l-1)}_{i,h,k})]\} / GMM_{a,i,h}$ for all OOS Instructions Sequence 1 through L $OOS^{'-}_{i,h,k,l} = \{\max[OOS^{-}_{i,h,k,l} * GMM_{a,i,h}, \min(0, E^{(1,l-1)}_{i,h,k})]\} / GMM_{a,i,h}$ for all OOS Instructions Sequence 1 through L $E^{(1,l)}_{i,h,k} = E^{(1,l-1)}_{i,h,k} - OOS^{'+}_{i,h,k,l} * GMM_{a,i,h} - OOS^{'-}_{i,h,k,l} * GMM_{a,i,h}$ for all OOS Instrcutions Sequence 1 Through L $E^{(2)}_{i,h,k} = E^{(1,L)}_{i,h,k}$ $ESE^{r}_{i,h,k} = \max[ESE^{-}_{i,h,k}, \min(0, E^{(2)}_{i,h,k})]$ Instructed decremental Supplement Energy $E^{(3)}_{i,h,k} = E^{(2)}_{i,h,k} - ESE^{'-}_{i,h,k}$ $ESE^{'+}_{i,h,k} = \min[ESE^{+}_{i,h,k}, \max(0, E^{(3)}_{i,h,k})]$ Instructed incremental Supplement Energy $E^{(4)}_{i,h,k} = E^{(3)}_{i,h,k} - ESE^{'+}_{i,h,k}$ $ERR^{'}_{i,h,k} = \min[ERR_{i,h,k}, \max(0, E^{(4)}_{i,h,k})]$ Instructed Energy from Replacement Reserve $E^{(5)}_{i,h,k} = E^{(4)}_{i,h,k} - ERR^{'+}_{i,h,k}$ $ENS^{'}_{i,h,k} = \min[ENS_{i,h,k}, \max(0, E^{(5)}_{i,h,k})]$ Instructed Energy from Non Spin reserve $E^{(6)}_{i,h,k} = E^{(5)}_{i,h,k} - ENS^{'}_{i,h,k}$ $ESR^{'}_{i,h,k} = \min[ESR_{i,h,k}, \max(0, E^{(6)}_{i,h,k})]$ Instructed Energy from Spin Reserve $E^{(7)}_{i,h,k} = E^{(6)}_{i,h,k} - ESR^{'}_{i,h,k}$ $RIE^{'}_{i,h,k} = \min[RIE_{i,h,k}, \max(0, E^{(7)}_{i,h,k})]$ if $RIE_{i,h,k} >= 0$ Instructed Residual Imbalance Energy $RIE^{'}_{i,h,k} = \max[RIE_{i,h,k}, \min(0, E^{(7)}_{i,h,k})]$ if $RIE_{i,h,k} < 0$								
65	0481	Excess Cost for Instructed Energy	Energy delivered [per SC, per Location/Interchange] having a price segment > MCP^{+}	MWh / Trading Interval	Amount Due = $-1 * \Sigma_n[\min(AIE_{i,h,k,n}, BE_{i,h,k,n}) * EP_{i,h,k,n}]$ Price = -1 * Amount Due / Billable Quantity	$/MWh	P = -Amt / BQ	10-Minute	Y	12/12/00	Open
			$AIE_{i,h,k,n}$ = Acknowledged Interval Energy for resource i, hour h, interval k and price segment n $BE_{i,h,k,n}$ = Remaining Instructed Energy for resource i, hour h, interval k and before price segment n $E^{'}_{i,h,k}$ = Instructed energy for a given energy type (eg. Spin, Non Spin, OOS, Supplemental, etc.) for resource i, hour h and interval k.(For calculations, see charge type 401) $EP_{i,h,k,n}$ = Excess price above MCP for resource i, hour h, interval k and price segment n $P_{i,h,k,n}$ = Instructed price for resource i, hour h, interval k and price segment n $MCP_{h,k}$ = Market Clearing Price for hour h and interval k $BE_{i,h,k,1} = E^{'}_{i,h,k}$ $BE_{i,h,k,n+1} = MAX[(BE_{i,h,k,n} - AIE_{i,h,k,n}),0]$ $EP_{i,h,k,n} = MAX[(P_{i,h,k,n} - MCP_{h,k}), 0]$								
UFE & Uninstructed Energy Settlements											
Ret	0402	Generation Deviation	Zonal Generation Deviation Quantity [per SC, per Zone]	MWh / trading interval	Ex-Post Zonal MCP	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	8/31/00
			Generation Deviation Quantity = $(G_s * GMM_f) - [(G_a - G_{adj}) * GMM_a - G_{a/s + Suppl. Energy}]$								

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
Ret	0403	Load Deviation	Load Deviation [per SC, per zone]	MWh / trading interval	Ex-Post Zonal MCP	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	8/31/00
			Load Deviation Quantity = -1 * {Ls - [(La - Ladj) + $L_{a/s + Suppl. Energy}$]}								
Ret	0405	Import Deviation	Import Deviation Quantity [per SC, per zone]	MWh / trading interval	Ex-Post Zonal MCP	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	8/31/00
			Import Deviation Quantity = $(I_s * GMM_f) - [(I_a + I_{a/s + Suppl. Energy} - I_{adj}) * GMM_a] + I_{a/s + Suppl. Energy}$								
Ret	0404	Export Deviation	Export Deviation Quantity [per SC, per zone]	MWh / trading interval	Ex-Post Zonal MCP	$/MWh	Amt = BQ*P	Hourly	Y	4/1/98	8/31/00
			Export Deviation Quantity = -1 * $\{E_s - [E_a + E_{adj}]\}$								
66	0406	SC Unaccounted for Energy ($UFE_{logical}$)	UFE Quantity [per SC, per Zone]	MWh / trading interval	Price = Amount Due / Billable Qty	$/MWh	P = Amt / BQ	Hourly 10-Minute	Y	4/1/1998 9/1/2000	8/31/2000 Open
			$SC\ UFE_{(Zone)}$ =	Σ [$SC\ UFE_{(Demand\ Point)}$]							
			$SC\ UFE_{(Demand\ Point)}$ =	[SC Demand / (Total LoadUDC + Total ExportUDC)] * UDC UFE							
			SC Demand =	Metered load for a load resource, or final Hourahead export schedule for an intertie location							
			UDC UFE =	[(ImportsUDC - ExportsUDC) + GenerationUDC] - RTM LoadUDC - CM LoadUDC - ATL UDC							
			ATL UDC =	Σ[Total TLRC*(UDC Branch Losses/Control Area Branch Losses)]							
			Control Area Branch Losses=	$\Sigma_{Control\ Area}$ [UDC Branch Losses]							
			Total TLRC =	$\Sigma_{Control\ Area}$ [Ga * (1 - GMMa)] + Σ[ImportIntertie * (1-TMMa)]							
			Amount Due =	Σ_{Zone} [$SC\ UFE_{(Demand\ Point)}$ * $Price_{(Demand\ Point)}$]							
			$Price_{(Demand\ Point)}$ =	Interval INC Price when UFE > 0; Interval DEC Price when UFE < 0.							
67	0407	Uninstructed Energy	Sum of Uninstructed Energy [Per SC, per Congestion Region]	MWh / trading interval	Price = DEC MCP if Billable Quantity > 0 INC MCP if Billable Quantity < 0	$/MWh	P = -Amt / BQ	10-Minute	Y	9/1/00	Open
			$UE_{h,k,r}$ = Sum of Uninstructed Energy of all resources in congestion region 'r'								
			$MCP^{-}_{h,k,r}$ = Decremental Energy Price in region 'r'								
			Uninstructed Deviation, $UD_{i,h,k} = E^{(7)}_{i,h,k} - RIE'_{i,h,k}$ (For $E^{(7)}$ and $RIE'_{i,h,k}$ refer to charge type 0401)								
			For Generator: $UE_{i,h,k} = UD_{i,h,k} - UCSR_{i,h,k} - UCNS_{i,h,k} - UCRR_{i,h,k}$ if $MCP^{-}_{h,k,r} > 0$								
			$UE_{i,h,k} = UD_{i,h,k}$ if $MCP^{-}_{h,k,r} <= 0$								
			For Load: $UE_{i.h.k} = UD_{i.h.k} - UCNS_{i.h.k} - UCRR_{i.h.k}$ if $MCP^{-}_{h.k.r} > 0$								
			$UE_{i,h,k} = UD_{i,h,k}$ if $MCP^{-}_{h,k,r} <= 0$								
			For Import: $UE_{i,h,k} = S_{i,h,k} * (GMM_{a,i,h} - GMM_{f,i,h}) + OA_{i,h,k} * GMM_{a,i,h} - (ESE'^{+}_{i,h,k} + ESE'^{-}_{i,h,k} + ESR'_{i,h,k} + ENS'_{i,h,k} + ERR'_{i,h,k}) * (1 - GMM_{a,i,h})$								
			For Export: $UE_{i,h,k} = OA_{i,h,k}$								
			Where $UE_{i,h,k}$ = Uninstructed Energy; $UD_{i,h,k}$ = Uninstructed Deviation; $UCSR_{i,h,k}$ = Unavailable Spin Reserve								
			$UCNS_{i,h,k}$ = Unavailable Non Spin Reserve; $UCRR_{i,h,k}$ = Unavailable Repl. Reserve;								
			$ESR'_{i,h,k}$ = Delivered Energy from Spin Capacity;								
			$ENS'_{i,h,k}$ = Delivered Energy from Non Spin Capacity;								
			$ERR'_{i,h,k}$ = Delivered Energy from Repl. Reserve;								
			$OA_{i,h,k}$ = Operational Adjustment (made by SC).								
			To derive Total Unavailable Capacity, $UC_{i,h,k}$:								
			For Generator, $UC_{i,h,k} = \max\{0, \min\{UD_{i,h,k}, M_{i,h,k} * GMM_{a,i,h} -$								
			$[P_{max\ i} / 6 * GMM_{a,i,h} - \max(0, CSR_{i,h,k} - ESR'_{i,h,k}) - \max(0, CNS_{i,h,k} - ENS'_{i,h,k}) - \max(0, CRR_{i,h,k} - ERR'_{i,h,k})]\}\}$								
			For Load, $UC_{i,h,k} = \max[0, \min(UD_{i,h,k}, \max(0, CNS_{i,h,k} - ENS'_{i,h,k}) + \max(0, CRR_{i,h,k} - ERR'_{i,h,k}) - M_{i,h,k})]$								

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS: Billable Quantity (BQ)	Units	Price (P)	Units	Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period: Start	End
			where $CSR_{i,h,k}$ = Scheduled Spin capacity for the hour 'h' / 6 $CNS_{i,h,k}$ = Scheduled Non Spin Capacity for the hour 'h' / 6 $CRR_{i,h,k}$ = Scheduled Repl. Reserve for the hour 'h' / 6 $UCSR_{i,h,k} = \min\{UC_{i,h,k}, \max(0, CSR_{i,h,k} - ESR'_{i,h,k})\}$ $UCNS_{i,h,k} = \min\{UC_{i,h,k} - UCSR_{i,h,k}, \max(0, CNS_{i,h,k} - ENS'_{i,h,k})\}$ $UCRR_{i,h,k} = \min\{UC_{i,h,k} - UCSR_{i,h,k} - UCNS_{i,h,k}, \max(0, CRR_{i,h,k} - ERR'_{i,h,k})\}$								
68	0487	Allocation of Excess Cost for Instructed Energy	SC's Net Negative Uninstructed Energy in the Control Area [Per SC]	MWh / Trading Interval	Price = $UEP_{h,k}$ (see formulation below)	$/MWh	Amt = -BQ*P	10-Minute	Y	12/12/2000 3/1/2001*	2/28/01 Open
			$UE^{-}_{j,h,k}$ = min(0, Sum of Uninstructed Energy, excluding Reg Down units, for SC j in hour h, and interval k) (See charge type 407 for defintion of UE.) $UE^{-}_{h,k}$ = $\Delta 35UE^{-}_{j,h,k}$ $EC_{h,k}$ = Total excess costs paid in charge type 481 in hour h and interval k $UEP_{h,k}$ = $EC_{h,k} / UE^{-}_{h,k}$ $Amount\ Due_{j,h,k} = -1 * UEP_{h,k} * abs(UE^{-}_{j,h,k})$ On 3/1/2001, the allocation is changed from a regional basis to Control Area basis.								
No-Pay Provision Settlements											
Ret	0130	Insufficient Energy in Response to ISO Instructions	Unavailable A/S Capacity [per SC, per location]	MW-hr	Pseudo Price = Settlement Amount / Billable Quantity	$/MW-hr	P = Amt / BQ	Hourly	Y	Not Used	Not Used
			Calculated only when Metered Output < Instructed Quantity. Unavailable A/S Capacity = Bid-in or Self Provided Capacity for resource - Metered Output Settlement Amount = Spin Adjustment + Non-Spin Adjustment + Replacement Reserve Adjustment Spin Adjustment = Unavailable Spin Capacity * SC DA & HA Weighted Average Spin Rate Non-Spin Adjustment = Unavailable Non-Spin Capacity * SC DA & HA Weighted Average Non-Spin Rate Replacement Adjustment = Unavailable Replacement Capacity * SC DA & HA Weighted Average Replacement Rate								
Ret	0131	Reduction in Available Capacity Due to Uninstructed Deviation	Unavailable A/S Capacity [per SC, per location]	MW-hr	Pseudo Price = Settlement Amount / Billable Quantity	$/MW-hr	P = Amt / BQ	Hourly	Y	Not Used	Not Used
			Calculated only when actual unloaded capacity is less than required. Unavailable A/S Capacity = Required Unloaded Capacity - Actual Unloaded Capacity Required Unloaded Capacity = Committed Capacity - Instructed Quantity For generator, Actual Unloaded Capacity = Max Unit Capacity - Metered Output For load, Actual Unloaded Capacity = Metered Output Settlement Amount = Spin Adjustment + Non-Spin Adjustment + Replacement Reserve Adjustment + Energy Adjustment Spin Adjustment = Unavailable Spin Capacity * SC DA & HA Weighted Average Spin Rate Non-Spin Adjustment = Unavailable Non-Spin Capacity * SC DA & HA Weighted Average Non-Spin Rate Replacement Adjustment = Unavailable Replacement Capacity * SC DA & HA Weighted Average Replacement Rate Energy Adjustment = Total Unavailable Capacity * Zonal Energy MCP								

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS: Billable Quantity (BQ)	Units	Price (P)	Units	Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period: Start	End
69	0141	No Pay Charge - Spinning Reserve	No Pay Spin Qty = max[NPSR(1)$_{i,h,k}$, NPSR(2)$_{i,h,k}$, NPSR(3)$_{i,h,k}$] [per SC, Per Location]	MW-hr	Amount Due is calculated by prorating the Billable Quantity between DA and HA markets and multiplying with the corresponding MCP for Spin Reserve. Price = Amount Due / Billable Quantity	$/MW-hr	P = Amt / BQ	10-Minute	Y	9/10/00	Open
			$NPSR_{i,h,k} = \max[NPSR^{(1)}_{i,h,k}, NPSR^{(2)}_{i,h,k}, NPSR^{(3)}_{i,h,k}]$ Where $NPSR^{(1)}_{i,h,k} = UCSR_{i,h,k}$ (For definition of $UCSR_{i,h,k}$, refer to Charge Type 407.) $NPSR^{(2)}_{i,h,k} = (CSR_{i,h} - ASR_{i,h,k}) / 6$ if $ASR_{i,h,k} < ISR_{i,h,k}$; $NPSR^{(2)}_{i,h,k} = 0$ if $ASR_{i,h,k} = ISR_{i,h,k}$; $NPSR^{(3)}_{i,h,k} = [(CSR_{i,h} - (ESR'_{i,h,k} / ESR_{i,h,k}) * ASR_{i,h,k})] / 6$ if $(ESR_{i,h,k} > 0$ and $ESR'_{i,h,k} < f * ESR_{i,h,k})$; $NPSR^{(3)}_{i,h,k} = 0$ otherwise. $ASR_{i,h,k}$ = Acknowledged Spinning Reserve dispatch target $ISR_{i,h,k}$ = Instructed Spinning Reserve dispatch target $ESR_{i,h,k}$ = Acknowledged Energy from Spinning Reserve $ESR'_{i,h,k}$ = Delivered Energy from Spinning Reserve f = No Pay Relative Tolerance Factor							
70	0142	No Pay Charge - Non Spinning Reserve	No Pay Non Spin Qty = max[NPNS$^{(1)}_{i,h,k}$, NPNS$^{(2)}_{i,h,k}$, NPNS$^{(3)}_{i,h,k}$] [per SC, Per Location]	MW-hr	Amount Due is calculated by prorating the Billable Quantity between DA and HA markets and multiplying with the corresponding MCP for Non Spin Reserve. Price = Amount Due / Billable Quantity	$/MW-hr	P = Amt / BQ	10-Minute	Y	9/10/00	Open
			The No Pay Non Spin billable quantity is calculated in a similar way as in Charge Type 0141.								
71	0144	No Pay Charge - Replacement Reserve	No Pay Repl. Reserve Qty = max[NPRR$^{(1)}_{i,h,k}$, NPRR$^{(2)}_{i,h,k}$, NPRR$^{(3)}_{i,h,k}$] [per SC, Per Location]	MW-hr	Amount Due is calculated by prorating the Billable Quantity between DA and HA markets and multiplying with the corresponding MCP for Replacement Reserve. Price = Amount Due / Billable Quantity	$/MW-hr	P = Amt / BQ	10-Minute	Y	9/10/00	Open
			The No Pay Replacement Reserve billable quantity is calculated in a similar way as in Charge Type 0141.								
72	1030	No Pay Provision Market Refund	SC's Metered Demand[5] in the Control Area [Per SC]	MWh/trading interval	Per Unit Price = Total No Pay Revenue / Total Metered Demand in the Control Area	$/MWh	Amt = -BQ*P	10-Minute	Y	9/10/00	Open
Effective Price Settlements											
Ret	0502	Generation Deviation from Instructed Energy	Undelivered Instructed Energy (Inc. or Dec.)	MWh/Trade Interval	The difference between the resource's Effective Price and the Hourly Expost Price.	$/MWh	Amt = BQ*P	Hourly	Y	8/18/99	8/31/00
Ret	0503	Load Deviation from Instructed Energy	Undelivered Instructed Energy (Inc. or Dec.)	MWh/Trade Interval	The difference between the resource's Effective Price and the Hourly Expost Price.	$/MWh	Amt = BQ*P	Hourly	Y	8/18/99	8/31/00
Ret	0505	Import Deviation from Instructed Deviation	Undelivered Instructed Energy (Inc. or Dec.)	MWh/Trade Interval	The difference between the resource's Effective Price and the Hourly Expost Price.	$/MWh	Amt = BQ*P	Hourly	Y	8/18/99	8/31/00

NOTES:

1 Automated Charge Types are those that are normally calculated and generated by ISO Settlement System. However, they may also appear as Manual Line Item Entries.

ISO Settlement Charge Matrix

REF	Chrg ID	Charge Name	KEY PARAMETERS				Settlement Amt	Charge Granularity	Automated[1]	Effective Trade Period	
			Billable Quantity (BQ)	Units	Price (P)	Units				Start	End
	Charge Types that have 'N' in the Automated column will only appear in the Statement File as Manual Line Item Entries.										
2		indicates charge types that have been retired or marked for retirement. Retired Charge Types may still appear in subseqeuent Statement Files due to retroactive adjustments.									
3		shaded areas are future Charge Types that are inactive.									
4		indicates charge types that are created/modified in this revision.									
5	Metered Demand is the sum of metered loads, HA export schedules by intertie locations and RT adjustments to export schedules.										
6	Location may refer to a Generator, Load, Control Area Intertie, or Branch Group.										
7	Capacity service is measured in MW-hr. MW-hr is different from MWh which is an unit for energy.										
8	Beginning trade date 6/21/01, the settlement MCPs for all A/S types and real time incremental MCP reflect a 10% Credit Risk Adder (per FERC Order dated 6/19/01).										