

Market Operations Template
(See last page for notes which includes a list of acronyms used.)

Topic/Issue	Day-Ahead Process		Post-Day Ahead Process		Real-Time Process		Questions/Comments
	Y/N	Description	Y/N	Description	Y/N	Description	
1. 1. Scheduling	Y	RTOW develops a combined schedule operation of the transmission service, provision of ancillary services (regulation & reserves) and energy to meet actual losses based on submitted schedules and bids.			Y		<u>DA</u> : If an average loss model is used, the loss calculation uses self-supplied loss energy and bids to match actual losses for the combined schedule (adjusting for variance between applicable loss factor and actual losses.)
1.1 Submission Deadline	Y	Specified by RTOW on OASIS	Y	Specified by RTOW on OASIS (i.e., the cutoff time to RT operations)			
1.2 Self-Scheduling	Y				Y		
1.2.1 Supplier-Committed Self Schedule	N	Supplier self-schedules injection by submitting MW and location.	N	Supplier may increase amount of energy self-scheduled above DA submission without regard to nodal prices (becomes a price taker).			<u>DA</u> : NOPR Tariff implies that the generation is fixed without a matching load/export. Provision doesn't apply in RTO West balanced submission scheme? <u>PDA</u> : Same issue as DA.
1.2.2 ITP-Committed Self Schedule	N	Supplier submits MW, location and MWh available. RTOW develops schedule based on maximizing revenue within energy limit.					<u>DA</u> : This is a fixed energy injection which RTOW would be able to shape. The suggested structure is useful for a redispatch or A/S bid, however, since it is an unbalanced injection, it doesn't fit the RTOW model.
1.2.3 Self-Supply of Ancillary Services	Y	Suppliers of resources may self-supply based on rules of ancillary services markets.	?		Y ?	Self-trackers may meet imbalance obligations, but must provide RTOW with a dynamic schedule.	(1) This provision may be better located with bilateral transactions below for all periods. (2) <u>PDA</u> : Can a self-supplier of A/S increase the capacity provided for A/S subject to settlement at RT prices? (3) The Metering, Control and Communications Team has assignment for the technical details of implementing self-tracking and dynamic schedules.
1.3 Bilateral Transactions	Y				Y		In this section of the NOPR Tariff, bilateral are assumed to be simple point-to-point schedules. This section should be generalized to cover SC schedules from sets of DPs to sets of RPs, to cover inc/dec bids for these points by an SC and to encompass the section entitled "Transmission Scheduling", which overlaps the bilateral transactions. Is added terminology to differentiate of points on and off RTO West controlled facilities, i.e., injection & withdrawal points for Class A and C, DP & RP for Class B & D? In the alternative could DP/RP be generalized to cover all points?
1.3.1 Internal Transactions	Y	SCs specify RP(s) and DP(s) and MW injected and withdrawn at each point(s). SCs may also submit a price bid (\$/MW) over some or all points and over all the MW range to allow RTOW to redispatch.	Y	Schedules modified must submit RP(s) and DP(s) and MW injected or withdrawn at each point(s). May voluntarily submit a bid to eliminate transaction or a Dec Bid (\$/MW) to reduced injection at RP(s).			All RPs and DPs are within RTOW system.
1.3.2 External Transactions	Y	Same submission rules as internal transactions, except price bid will only enter RTOW's determination of its combined schedule offered price is below calculated nodal price at the transactions sink.	Y	Schedules modified must submit RP(s) and DP(s) and MW injected or withdrawn at each point(s). May voluntarily submit a bid to eliminate transaction or a Dec Bid (\$/MW) to reduced injection at RP(s).		Same submission rules as internal transactions, except Exports may submit Dec Bid (\$/MW) to lower injection at RP keeping DP withdrawal constant and Imports can submit Inc Bid (\$/MW) to reduce DP withdrawal keeping RP injection constant.	External if an RP or DP is at a External Interface Point of RTOW. <u>DA</u> : Reason for non-participation of bid? Assumes ramping done by scheduling resource to a ramping standard? Does this fall under ancillary service standards?
1.4 Bidding Rules	Y	Reference to eligibility rules			Y	Reference to eligibility rules	

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1.5	Bid-Based Resource Commitment	Y	For needed reserves needed for A/S to be provided by RTOW or for added energy to meet loss mismatch.					Resource Commitment is primarily voluntary and matches load based on submission of schedule balancing loads and resources. Supplemental Resource Commitment may required where SCs has opted for RTOW to provide A/S. Commitment process probably simply the acceptance of capacity (or energy) bids.
1.6	Price Determination	Y	As described in 3.5, 5.5, 6.5 and 7.5 below.					
1.7	Load Forecasts	Y	SCs provide forecasts (in schedules). RTOW prepares a posted advisory forecast using received data from SCs and its own analysis.					Posted prior to DA?
1.8	Reliability-Based Resource Commitment	Y	When RTOW load forecast exceeds sum of load scheduled and resources available to meet full load in RT are not adequate, RTOW will commit added resources as Replacement Reserves to insure "lights stay on".					(1) With balanced submissions, this means RTOW's estimate of load and reserves required exceeds resources self-committed. This step takes place after calculation of settlement prices for DA. Such resource commitments are most likely call contracts on hydro in RTOW, but may include peaking gas on east side of the system. (2) Acceptance of a call bid condition on an energy bid or willingness to accept RT nodal price. (3) Could there be a need for "puts" to back down units if not enough Dec Bids are received?
1.9	Reliability Forecast	N						This is a NOPR Tariff provision for committing intermediate type thermal units up more than one day in advance based on a one week look ahead to minimize start-up, minimum load constraints.
1.10	Posting Schedules	Y	RTOW's combined schedule resulting from DA process is posted in aggregate on OASIS, nodal prices, load, etc. Specific final schedules of SCs are also posted for their use, but SCs can see only their own data and not the proprietary data of others.					DA settlement is based on DA nodal prices and is financially binding.
1.11	Bid Revenue Sufficiency	N						Provision in NOPR Tariff is to augment payments under DA settlement if start-up and minimum run costs are not fully covered over 24 hours. Provision also covers selected demand bid where maximum willingness to pay is exceeded over 24 hour period. Bids submitted to RTO are to incorporate the these cost uncertainties. Should we reconsider consistency with multi-part bid decision?
2.	Intra-Day Resource Commitment and Dispatch			Y				
2.1	Intra-Day Resource Commitment			Y	May commit added resources if required beyond DA schedule.			RT: Exercising previous calls or commit added resource or both?
2.2	Security Constrained Dispatch			Y	Uses bids valid for period.			DA bids do not automatically carry over to PDA and RT, providing a "free option" to RTOW. Additional bids solicited for each period as described below.

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2.3 Bid Revenue Sufficiency			N ?				Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
3. Energy Market		(Congestion Redispatch, Reserves and Loss Energy Market)				(Balancing and Loss Energy, Congestion Redispatch and Reserves Market)	
3.1 General	Y	Transmission congestion redispatch, A/S reserves and loss energy (for average loss methodologies, a correction to the variance between actual and loss factors).			Y	Balancing energy, transmission congestion redispatch, A/S reserves and loss energy (for average loss methodologies, the variance between actual and loss factor).	
3.2 RTO Obligations	Y				Y		
3.3 Purchaser Rules	Y	For A/S			Y	For A/S	Dec bids at DPs are de facto purchasers.
3.3.1 Specification of Bids	N	A/S purchasers from RTOW are price takers.			N	A/S purchasers from RTOW are price takers.	NOPR Tariff written for acquisition of short supply. Under balanced schedule submissions, there are no short positions. De facto purchase in redispatch is covered under generalized Supplier bids.
3.3.2 Specification of Virtual Bids	N						Virtual bids are a feature of full energy market without a balanced load/resource submission requirement.
3.3.3 Period of Bids	N						
3.4 Supplier Rules and Obligations	Y				Y		
3.4.1 Eligibility to Supply	Y				Y	May not re-submit capacity selected to provide services DA. Capacity not selected to provided DA energy may alter bid.	(1) Adopt different rules from NOPR for re-bidding capacity. (2) Demand participation to be further developed, i.e., (a) What products can they supply? (b) What is their role in DA market? (c) the technical capability of various types of demand response. (d) Settling issues related to title to power and energy.
3.4.2 Specification of Bids	Y	Bids valid from submission until close of DA.	Y	Bids submitted for each hour with a rolling window for bid submission ending ____ minutes before operating hour.			Forcing the DA bids to carry to RT provides RTOW an option for the entire period, so bidders will impute the cost of the option in submissions. By allowing re-bidding of non-selected resources, the bidders will not include a 24 plus hour option in their DA bids.
3.4.2.1 Bid Prices & Quantities	Y	Price components, i.e., Inc energy (\$/MWh), start-up(\$), no-load(\$/hr), Emergency Inc energy (\$/MWh).	Y	Price components, i.e., Inc energy (\$/MWh), start-up(\$), no-load(\$/hr), Emergency Inc energy (\$/MWh).			(1) Inc/Dec Bids by DP and RP are submitted with bilateral schedules. (2) Independent bids for resources not part of schedule submission may also be made. (3) Multi-part bids allowed to describe characteristics of resources (the components of multi-part bids for hydro need to be defined, but may include such features as energy limitations). (4) Nodes do not need to be unit by unit, may include aggregate nodes (e.g. all units in a plant) where there is no difference in power flow effects.
3.4.2.2 Bid Data Requirements	Y	Non-price components	Y	Non-price components			Non-price components, i.e., response rate, min, max, etc.
3.4.3 Virtual Bids - Incremental Energy	N						See 3.3.2 above.
3.4.4 Virtual Bids - Decremental Energy	N						See 3.3.2 above.
3.4.5 Period of Bids	Y	Price and quantity may vary by hour over DA.			Y	Price and quantity may vary by hour over RT	Suppliers may rebid capacity not selected in DA by close of process for use in RT.

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3.5 Calculation of Locational Prices	Y				Y		
3.5.1 Energy Price Calculation	Y	Nodal prices for redispatch and loss energy.			Y	An Ex-Ante forecast of nodal prices is posted for the upcoming RT interval. The Ex-Post nodal prices calculated at the end of the RT interval.	
3.5.1.1 Congestion Cost Component	Y				Y		Without an average loss methodology, the price spread between a DP and RP is only congestion cost component.
3.5.1.2 Losses Component	?	Depends upon loss methodology			?	Depends upon loss methodology	Applies if marginal loss methodology used but not under average loss methodologies.
3.5.1.3 Energy Prices for Fixed Block Resources					Y	Fixed Block Bids (not adjustable in 1 MW increments) are price takers since they are not responsive to dispatch.	(1) This entry should be generalized to cover other variable output (sometimes called intermittent) resources which become price takers, e.g., wind, "run of ditch" hydro, some types of geothermal or co-gen. (2) Are provisions needed in the penalty section or are they integrated by SCs into larger portfolios of resources? (3) Need to consider the regulation burden imposed by these resources on other resources.
3.5.1.4 Five-Minute Interval Prices					Y	A short minute-by-minute interval with hourly integrated prices calculated from interval prices are used for settlement.	(1) PJM uses 5 minute interval and settles using hourly integrated values. (2) CAISO has an "Hour-Ahead" market settlement (operating two-hours ahead) and real time settlements for every 10 minute interval. SMD proposal for 5 minute intervals and 5 minute settlements. (3) For seams compatibility, should the dispatch interval be matched to CAISO at 10 minutes?
3.5.2 Hub Price Calculation	Y	Fixed weight averages if nodal prices			Y	Fixed weight averages if nodal prices	Provided at request of customers for a set of identified nodes.
3.5.3 Zone Price Calculation	Y	Load weighted averages nodal prices			Y	Load weighted averages nodal prices	Load zones can be specified by any customer for their set of loads, subject to agreement of all loads at nodes within the zone. White paper on Hubs and Zones to be developed.
3.6 Calculation of Additional Payments & Charges	N				Y		Bids are to incorporate cost uncertainties. As presently stated in this template there is an apparent inconsistency between this position and the use of multi-part bids.
3.6.1 Bid Revenue Sufficiency	N				N	?	Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
3.6.2 Under generation by Suppliers					Y	Penalties for failure to supply	
3.6.3 Other Payments & Charges	?				N		Proposed by RTO if needed
3.7 Market Rules for Shortages & Emergencies	Y				Y		Adjustments to normal rules for emergencies, such as out of market calls and payments, etc.
3.8 Settlement	Y	Provide timely settlements			Y	Provide timely settlements	
3.8.1 Payments by Purchasers	Y	For A/S (or losses?) at nodal DA prices established					
3.8.2 Payments to Suppliers	Y	Paid nodal DA prices for DA energy delivered					
3.8.3 Payments by Suppliers	Y	Pay nodal DA prices for de facto purchases resulting from redispatch					

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3.8.4		Actual Injections Less-than Sched Injections			Y	Supplier pays	Imbalance energy based on hourly settlement values derived from integration of dispatch interval values.
3.8.5		Actual Injections Greater-than Sched Injections			Y	Supplier paid	Imbalance energy based on hourly settlement values derived from integration of dispatch interval values.
3.8.6		Actual Withdrawal Less-than Sched Withdrawal			Y	Purchaser paid	Imbalance energy based on hourly settlement values derived from integration of dispatch interval values.
3.8.7		Actual Withdrawal Greater-than Sched Withdrawal			Y	Purchaser pays	Imbalance energy based on hourly settlement values derived from integration of dispatch interval values.
4. Transmission Scheduling							
4.1	Y	General					Section should be incorporated with Section 1 on Scheduling and generalized to fit schedules from sets of RPs to sets of DPs.
4.2		Transmission Request (DA) & Bids (RT)					
4.2.1	Y	Information Provided by Customer	Y	SC provides RTOW with schedule: RP(s) & DP(s), MW by hr, max charge willing to pay (for single RP-DP pair), willingness to provide losses at RP in lieu of paying for losses. Schedule may include a maximum congestion cost at which the schedule should be cancelled, for a single DP to single RP schedule.	Y	SC provides RTOW with modification schedule subject to prices determined in RT: RP(s) & DP(s), MW by hr, max charge willing to pay (for single RP-DP pair), willingness to provide losses at RP in lieu of paying for losses. Schedule may include a maximum congestion cost at which the schedule should be cancelled, for a single DP to single RP schedule.	For CTR usage, details regarding the physical location must be provided (to be developed) that are within existing right for DPs and RPs (color coding).
4.3	Y	Calculation of Transmission Usage Charges		MW withdrawn at DP multiplied by (hourly nodal DA price at DP minus hourly DA nodal price at RP)	Y	MW withdrawn at DP multiplied by (interval nodal RT price at DP minus interval nodal RT price at RP)	Exposure between DA and RT a continuing concern.
4.3.1	Y	Congestion Cost Component		Same as for energy market above	Y	Same as for energy market above	
4.3.2	?	Loss Component			?		Applicable if marginal loss methodology applied.
4.4	N	Flowgate Price Calculation			N		NOPR Tariff describes a congestion revenue right tied to the "shadow price" for a specific line element.
4.5	Y	Settlement of Transmission Rights					The effect of outages on congestion charge and settlement needs to be discussed further with a check on the level of detail provided in the Stage 2 filing.
4.5.1	Y	Point-to-Point Rights		FTO holders: Credit for value of FTO portfolio of SC up to but not exceeding total congestion cost. CTR holders: Credits to CTR holders up to but not exceeding congestion cost for rights defined in catalogue.	Y	CTR holders: Credits to CTR holders up to but not exceeding congestion cost for rights defined in catalogue and not used for DA settlement.	Details to come from Catalogue Team. Need provisions for an ownership registry and a cut off time for ownership transfers that will be recognized for settlement. FERC directed evaluation of incentives and disincentives associated with the "use or lose" nature of FTOs and CTRs.
4.5.2	N	Flowgate Rights					
4.6	Y	Disposition of Congestion Revenue Surplus/Deficit					
4.6.1	Y	Hourly Congestion Charge Collections		The net collections by RTOW for congestion redispatch in each hour DA, i.e, payments by purchasers, less payments to suppliers, plus congestion charges billed.			

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4.6.2	Hourly Congestion Revenue Owed Credits	Y	The total amount of congestion charge credits from CTRs and FTOs					
4.6.3	Determination and Disposition of Surplus/Deficit	Y	The Surplus/Deficit is equal to the Hourly Congestion Collection Less the Hourly Congestion Revenue Credits which are booked into the Replacement Revenue Pool.					See Stage 2 Pricing Proposal for details of disposition of surpluses.
4.7	Disposition of Loss Revenue Surplus	?						Dependent upon Losses Team recommendation.
4.7.1	Loss Charge Collection	?						Dependent upon Losses Team recommendation.
4.7.2	Determination and Disposition of Surplus	?						Dependent upon Losses Team recommendation.
5. Regulation & Frequency Response Market								
5.1	General	Y	Establishes clearing prices for suppliers that offer eligible capacity for Regulation.					
5.2	RTO Obligations	Y						
5.3	Purchase Rules & Obligations	Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the Regulation & Frequency Response Market through RTOW.			Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the Regulation & Frequency Response Market through RTOW.	
5.4	Supplier Rules & Obligations	Y		Y				
5.4.1	Eligibility to Supply	Y	Resource must be within RTOW service area, able to respond to AGC signals, meet RTOW performance standards and may not contract capacity designated for Regulation to provide Energy or Operating Reserve - Spinning to any party other than RTOW.	Y	Resource must be within RTOW service area, able to respond to AGC signals, meet RTOW performance standards and may not contract capacity designated for Regulation to provide Energy or Operating Reserve - Spinning to any party other than RTOW. Suppliers may not re-submit capacity selected for services DA.			RTOW performance standards to include capabilities, testing, verification, etc.
5.4.2	Specification of Bids	Y	Location, Availability Price (\$/MWh), Regulation Capability (MW), Response Rate (MW/min), Upper and lower regulation limits (MW), Hours available and other physical data required.	Y	Location, Availability Price (\$/MWh), Regulation Capability (MW), Response Rate (MW/min), Upper and lower regulation limits (MW), Hours available and other physical data required.			
5.4.3	Bidding & Scheduling Process			Y	1) Bids not accepted DA may be modified and re-submitted for RT. (2) DA bids may indicate desire for automatically consideration w/o change in RT market. (3) If Supplier reduces its available MW after being selected to supply Regulation or Operating Reserves (either DA or in a supplemental commitment) and no longer meet commitment for Energy, Regulation and Operating Reserves, the Suppliers scheduled amount of Regulation and Operating Reserve will be reduced to the level of available MW or zero Regulation and Operating Reserves can no longer be supplied.			

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5.5 Calculation of Clearing Price	Y	Clearing Price is the higher of (a) the highest Supplier Regulation Price needed to meet RTOW need for each hour of next day or (b) the highest Clearing Price for Operating reserves. The Supplier Regulation Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from expected output level had the resource been dispatched in merit order to supply Energy times the \$/MWh difference in nodal energy market price and the DA resource bid (if the difference is negative, the value is zero).			Y	Clearing Price is the higher of (a) the highest Supplier Regulation Price needed to meet RTOW need for each hour of next day or (b) the highest Clearing Price for Operating reserves. The Supplier Regulation Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from expected output level had the resource been dispatched in merit order to supply Energy times the \$/MWh difference in nodal energy market price and the RT resource bid (if the difference is negative, the value is zero).	
5.6 Calculation of Additional Payments & Charges	N				Y		
5.6.1 Bid Revenue Sufficiency	N				N ?		Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
5.6.2 Failure to Provide Regulation in Real-Time					Y	If a resource providing Regulation trips off line, RTOW will attempt to re-establish supply for the remainder of that resource's commitment. Any additional cost incurred by RTOW will be paid by the defaulting supplier. If the Availability Payment decreases as a result, RTOW will not pay the Supplier the difference in cost.	
5.6.3 Other Payments & Charges	N				N		Proposed by RTOW if needed.
5.7 Market Rules for Shortages	Y				Y		Rules for emergencies.
5.8 Settlements	Y	Provide timely settlements			Y	Provide timely settlements	
5.8.1 Payments by Purchasers						(1) The total obligation (MW) of each SC shall be a load ratio share of RTO West requirement for its service area. The net obligation shall be the greater of the SC's total obligation minus self-supplied Regulation or zero. (2) For each hour of RT, an SC shall be charged an amount equal to the aggregate net amount paid by RTOW to procure Regulation in an hour times the ratio of the SC's net obligations to the net obligations of all SCs.	
5.8.2 Payments to Suppliers	Y	Regulation Clearing Price multiplied by quantity selected DA.				RTOW will pay Suppliers the Regulation Clearing Price times the MW of Regulation capability.	NOPR Tariff describes Additional Payments If necessary for efficient market operations.

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5.9 Monitoring Suppliers and Generators					Y	(1) RTOW may establish: (a) resource performance criteria, (b) procedures to disqualify resources that consistently fail to meet criteria, and (c) procedures for requalifying resources, which may include a requirement to demonstrate performance for period of time. (2) RTOW shall implement a performance tracking system. (3) Payments to Suppliers of Regulation may be based on performance with respect to indices.	Verification of capability should be included in the performance monitoring system.
6. Operating Reserves Market - Spinning Reserve							
6.1 General	Y	Establishes clearing price for suppliers that offer eligible capacity for Operating Reserve - Spinning					
6.2 RTO Obligations	Y						
6.3 Purchaser Rules and Obligations	Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the OR-Spin Market through RTOW.			Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the OR-Spin Market through RTOW.	
6.4 Supplier Rules and Obligations	Y		Y				
6.4.1 Eligibility to Supply	Y	Resource must be within RTOW service area, meet RTOW performance standards and may not contract capacity designated for OR-Spin to provide Energy, Regulation or OR-Supp to any party other than RTOW.	Y	Resource must be within RTOW service area, meet RTOW performance standards and may not contract capacity designated for OR-Spin to provide Energy, Regulation or OR-Supp to any party other than RTOW. Suppliers may not re-submit capacity selected for services DA.			
6.4.2 Specification of Bids	Y	Location, Availability Price (\$/MWh), Response Rate (MW/min), Hours available and other physical data required.	Y	Location, Availability Price (\$/MWh), Response Rate (MW/min), Hours available and other physical data required.			
6.5 Calculation of Market Clearing Price	Y				Y		
6.5.1 Methodology for Calculation of Clearing Price	Y	Clearing Price is the higher of (a) the highest Supplier Spinning Reserve Price needed to meet RTOW for each distinct location need for each hour of next day or (b) the highest Clearing Price for OR-Supp for that hour. The Supplier Spinning Reserve Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from out put set point if it had been dispatched in merit order to supply Energy times the \$/MWh difference in nodal energy market price and the resource bid (if the difference is negative, the value is zero).			Y	Clearing Price is the higher of (a) the highest Supplier Spinning Reserve Price needed to meet RTOW for each distinct location need for each dispatch interval or (b) the highest Clearing Price in the dispatch interval for OR-Supp for that hour. The Supplier Spinning Reserve Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from out put set point if it had been dispatched in merit order to supply Energy times the \$/MWh difference in nodal energy market price and the resource bid (if the difference is negative, the value is zero).	

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6.5.2 Calculation of Zonal or Locational Prices	Y	Separate DA prices calculated for each Reserve Location for which there is a spinning reserve requirement, unless there is no congestion and there is a single price for RTOW.			Y	Separate DA prices calculated for each Reserve Location for which there is a spinning reserve requirement, unless there is no congestion and there is a single price for RTOW.	
6.5.3 Transmission for Operating Reserves	Y	Suppliers outside particular Reserve Location may provide Spinning Reserve if necessary transmission arrangements made. The cost of transmission service will have to be included in evaluating the cost of Operating Reserves.			Y	Suppliers outside particular Reserve Location may provide Spinning Reserve if necessary transmission arrangements made. The cost of transmission service will have to be included in evaluating the cost of Operating Reserves.	(1) Transmission arrangements for meeting locational reserve requirements needs to be clarified by the A/S Team. (2) For instance does the need for unloaded transmission capacity between reserve locations become an additional constraint with the security constrained dispatch, there by pricing the offer of such reserve offers? (3) Does ownership of FTOs or CTRs between the locations in the amount of the capacity offered deal with the equity of unloading transmission and potentially raising congestion cost?
6.6 Calculation of Additional Payments & Charges	N				N		Cost uncertainties to be included in bid.
6.6.1 Bid Revenue Sufficiency	N				N ?		Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
6.6.2 Failure to Perform in Real-Time					Y	When reserve is activated, RTOW will measure actual performance against expected performance and may charge financial penalties to suppliers of OR-Spin that fail to perform in accordance with accepted bids.	
6.6.3 Other Payments & Charges	Y				Y		Proposed by RTOW if needed.
6.7 Market Rules for Shortages	Y				Y		Rules for emergencies.
6.8 Settlements	Y	Provide timely settlements			Y	Provide timely settlements	
6.8.1 Payments by Purchasers						(1) The total obligation (MW) of each SC shall be the load ratio share of the RTOW's OR-Spin requirements by Reserve Location. The net obligation of an SC by Reserve Location shall be the greater of the SC's total obligation minus the amount of OR-Spin self-provided or zero. (2) For each RT hour, an SC shall pay an amount equal to the aggregate net amount paid by RTOW to acquired OR-Spin times the ratio of the SC's net obligations to the net obligations of all SCs.	NOPR Tariff bases payments on system wide share and price.
6.8.2 Payments to Suppliers	Y	RTOW pays the Clearing Price times MW of Spinning Reserve Capability provided.			Y	RTOW pays the Clearing Price times MW of Spinning Reserve Capability provided in excess of the amount scheduled DA.	
6.8.3 Payments by Suppliers					Y	The Supplier shall pay RTOW for any Spinning Reserve it was scheduled for DA and did not provide in RT. The payment shall be the RT Clearing Price for the Reserve Location times the MW not supplied plus an penalty for failure to provide described in 6.6.2 above.	

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6.9 Failure to Provide Operating Reserves					Y	(1) If a Supplier reduces its capacity scheduled to provide Regulation or Operating Reserves either DA or as Replacement Reserves, RTOW will if necessary first reduce the lowest quality Supplemental Reserve provided, then reduce the next higher quality Supplemental Reserve provided and finally reduce the amount of Spinning Reserve to be provided by the Supplier. (2) If a Supplier's scheduled resource trips off-line or had other capacity reduction, the Supplier shall be charged the Operating Reserve price by location in each hour it was scheduled to provide at that location. (3) If a resource schedule to provide any type Operating Reserves fails to provide Energy when called, (other than that which has previously tripped off-line) the supplier will be: (a) charged for the energy shortfall at applicable nodal RT price, (b) charge the a regulation penalty and (c) have Availability payments reduced.	
7. Operating Reserves Market - Supplemental Reserve							
7.1 General	Y	Establishes clearing price for suppliers that offer eligible capacity for Operating Reserve - Spinning					
7.2 RTO Obligations	Y						
7.3 Purchaser Rules and Obligations	Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the OR-Spin Market through RTOW.			Y	An SC may meet obligations by (1) self-supply (placing capacity capable of regulation under RTOW's control), (2) a bilateral contract with an eligible supplier or (3) by purchase in the OR-Spin Market through RTOW.	
7.4 Supplier Rules and Obligations	Y		Y				
7.4.1 Eligibility to Supply	Y	Resource must be within RTOW service area, meet RTOW performance standards and my not contract capacity designated for OR-Supp to provide Energy, Regulation or OR-Spin to any party other than RTOW.	Y	Resource must be within RTOW service area, meet RTOW performance standards and my not contract capacity designated for OR-Supp to provide Energy, Regulation or OR-Spin to any party other than RTOW. Suppliers may not re-submit capacity selected for services DA.			
7.4.2 Specification of Bids	Y	Location, Availability Price (\$/MWh), Response Rate (MW/min), Hours available and other physical data required.	Y	Location, Availability Price (\$/MWh), Response Rate (MW/min), Hours available and other physical data required.			
7.5 Calculation of Market Clearing Price	Y				Y		

Market Operations Template
(See last page for notes which includes a list of acronyms used.)

Topic/Issue	Day-Ahead Process		Post-Day Ahead Process		Real-Time Process		Questions/Comments
	Y/N	Description	Y/N	Description	Y/N	Description	
7.5.1 Methodology for Calculation of Clearing Price	Y	Clearing Price is the higher of (a) the highest Supplier Supplemental Reserve Price needed to meet RTOW for each distinct location need for each hour of next day or (b) the highest Clearing Price for a lower quality OR-Supp for that hour. The Supplier Supplemental Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from output set point if it had been dispatched in merit order to supply Energy times the absolute value of the difference between the \$/MWh nodal energy market price and the resource bid DA.			Y	Clearing Price is the higher of (a) the highest Supplier Spinning Reserve Price needed to meet RTOW for each distinct location need for each dispatch interval or (b) the highest Clearing Price in the dispatch interval for a lower quality OR-Supp for that hour. The Supplier Regulation Price is the sum of Suppliers Availability Bid and an amount equal to the deviation from output set point if it had been dispatched in merit order to supply Energy times the absolute value of the difference between \$/MWh nodal energy market price and the resource bid in RT.	
7.5.2 Calculation of Zonal or Locational Prices	Y	Separate DA prices calculated for each Reserve Location for which there is a spinning reserve requirement, unless there is no congestion and there is a single price for RTOW.			Y	Separate DA prices calculated for each Reserve Location for which there is a spinning reserve requirement, unless there is no congestion and there is a single price for RTOW.	
7.5.3 Transmission for Operating Reserves	Y	Suppliers outside particular Reserve Location may provide Spinning Reserve if necessary transmission arrangements made. The cost of transmission service will have to be included in evaluating the cost of Operating Reserves.			Y	Suppliers outside particular Reserve Location may provide Spinning Reserve if necessary transmission arrangements made. The cost of transmission service will have to be included in evaluating the cost of Operating Reserves.	(1) Transmission arrangements for meeting locational reserve requirements needs to be clarified by the A/S Team. (2) For instance does the need for unloaded transmission capacity between reserve locations become an additional constraint with the security constrained dispatch, there by pricing the offer of such reserve offers? (3) Does ownership of FTOs or CTRs between the locations in the amount of the capacity offered deal with the equity of unloading transmission and potentially raising congestion cost?
7.6 Calculation of Additional Payments & Charges	N				Y		
7.6.1 Bid Revenue Sufficiency	N				N ?		Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
7.6.2 Failure to Perform in Real-Time					Y	When reserve is activated, RTOW will measure actual performance against expected performance and may charge financial penalties to suppliers of OR-Spin that fail to perform in accordance with accepted bids.	
7.6.3 Exemptions					Y	Supplier will not be paid for Reserves provided in excess of amount scheduled by RTOW and Clearing Price will not be determined by a Bid not accepted by RTOW.	
7.6.4 Other Payments & Charges	Y				Y		Proposed by RTOW if needed.
7.7 Market Rules for Shortages	Y				Y		Rules for emergencies.
7.8 Settlement	Y	Provide timely settlements			Y	Provide timely settlements	

Market Operations Template
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Topic/Issue	Day-Ahead Process		Post-Day Ahead Process		Real-Time Process		Questions/Comments
	Y/N	Description	Y/N	Description	Y/N	Description	
7.8.1 Payments by Purchasers						(1) The total obligation (MW) of each SC shall be the load ratio share of the RTOW's OR-Supp requirements by Reserve Location. The net obligation of an SC by Reserve Location shall be the greater of the SC's total obligation minus the amount of OR-Supp self-provided or zero. (2) For each RT hour, an SC shall pay an amount equal to the aggregate net amount paid by RTOW to acquired OR-Supp times the ratio of the SC's net obligations to the net obligations of all SCs.	NOPR Tariff bases payments on system wide share and price.
7.8.2 Payments to Suppliers	Y	RTOW pays the Clearing Price times MW of Supplemental Reserve Capability provided.			Y	RTOW pays the Clearing Price times MW of Supplemental Reserve Capability provided in excess of the amount scheduled DA.	
7.8.3 Payments by Suppliers					Y	The Supplier shall pay RTOW for any Supplemental Reserve it was scheduled for DA and did not provide in RT. The payment shall be the RT Clearing Price for the Reserve Location times the MW not supplied plus an penalty for failure to provide as described in 7.6.2 above.	
<u>7.9 Failure to Provide Operating Reserves</u>					Y	Provisions of 6.9 apply to all Operating Reserves	
8. Other Real-Time Payments & Charges					Y		
8.1 Bid Revenue Sufficiency for Replacement Reserves					Y		
8.1.1 Payments to Suppliers					N ?	Aggregate recovery for 24 hour period unrecovered costs for start-up, no-load, etc.	Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
8.1.2 Charges to Customers							
8.1.3 Uncovered Bid Revenue Sufficiency Payments					N ?	Aggregate recovery for 24 hour period unrecovered costs for start-up, no-load, etc.	Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
8.2 Other Real-Time Bid Revenue Sufficiency Payments					Y		Proposed by RTOW as necessary.
8.2.1 Payments to Suppliers					N ?		Cost uncertainties to be included in bid. Should we reconsider consistency with multi-part bid decision?
8.2.2 Charges to Customers					Y	A purchase of RT Energy is deemed to have been made by any SC whose injections in any hour are less than DA schedule or whose withdrawals are greater than scheduled.	NOPR Tariff makes such purchase made subject to a share of the unrecovered bid revenue sufficiency guarantee payments.

Notes:

1. This template is based on the headings used in the SMD NOPR Tariff with modifications as necessary to describe the RTO West processes. The numbering used generally follows Part III, Section G), the description of the real-time processes. The Post-Day-Ahead and Real-Time activities have been split into two columns in this template, with shaded cells where an issue does not relate to the time period represented in that column.
2. Redline entries in the Topic/Issue Column represent suggested changes to fit RTO West model.

Market Operations Template
 (See last page for notes which includes a list of acronyms used.)

Topic/Issue	Day-Ahead Process Description	Post-Day Ahead Process Description	Real-Time Process Description	Questions/Comments
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3. Where a Question/Comment is specific to a given period, the Question/Comment is preceded by a underlined label.
4. The Day-Ahead Process begins at ____ (6:00, 7:00, ...?) of the day preceding the operating day and ends at ____ (5:00, 6:00, ...?) the same day.
 The Post-Day Ahead process begins at the end of Day-Ahead and extends to the cut-off time for schedule changes ____ minutes prior to an operating hour.
 The Real-Time process for each operating hour begins at the end of the Post-Day-Ahead process for that hour and extend to the end of the operating hour.
5. The following acronyms have been used in the body of the table to compress entries:
 A/S = Ancillary Services
 DA = Day-Ahead period
 DP = Delivery Point (a point where energy is withdrawn)
 OR-Spin = Operating Reserve - Spinning
 OR-Supp = Operating Reserve - Supplemental
 PDA = Post-Day Ahead period
 RP = Receipt Point (a point where energy is injected).
 RT = Real-Time period
 RTOW = RTO West
 SC = Scheduling Coordinator