Luminant

Draft for Discussion Purposes

Rolling CRR Auction Proposed NPRR 357 Discussion Points

June 9, 2011

Objective of Today's Discussion is for MCWG/CWG to Provide Comments on the Credit Related Aspects of NPR 357

Key Issues for Discussion

Operational Considerations

1) **Target implementation date of Rolling Auctions**
   a) Is there a need for an interim multi month auction?
2) **Amount of capacity to be released in auction**
3) **Cost and resources required for implementation of NPR 357**

Credit Related Considerations

1) **Appropriate methodology for collateralizing forward delivery periods in a rolling auction**
2) **Implementation of a pre-auction collateral screening process**
3) **Allow expected CRR revenue for QSE's with load to offset collateral requirements**

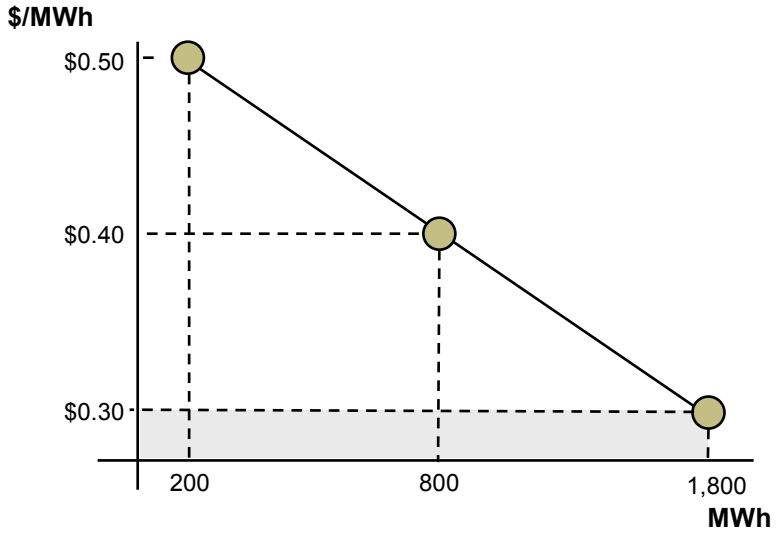
FOCUS OF DISCUSSION

Key Collateral Requirements of Proposal: Re-Cap

	Credit Risk	Credit Requirement
Prompt & Delivery Month	• "Pre-auction " risk is ability to fulfill obligation if awarded 100%	• Full notional value of volumes at bid /offer price • Adder applied to bid/offer volumes to take into account delivery month FCE
	• "Post-auction " risk is ability to fulfill actual settlement obligation	• Full notional value of awarded bids until invoice is paid • Collateralization of delivery month risk based on volumes that have not yet settled
	Only change to prompt/delivery month is the ability to offset expected CRR revenue against collateral requirements	• Allow QSE's with load to net anticipated revenue from CRR auction against collateral requirements (would involve estimating load ratio share)
Forward Months	• Ability to fulfill obligation if awarded CRR becomes "out of the money"	• Collateralize for mark to market exposure equal to difference between invoice price and new auction clearing price for that particular CRR instrument if "out of the money"
		• In addition an initial margin adder will be applied to all forward volumes and will be equal to – *Risk of price move between auctions* – *Risk of change to grid between auctions (State change)*
	Key principal is that forward month CRR's have value that can be realized through subsequent auctions	• Settlement of invoice to occur in month before delivery instead of pre-payment
		• Allow QSE's with load to net anticipated revenue from CRR auction against collateral requirements (would involve estimating load ratio share)

Implementing a Pre-Auction Collateral Screening Process will allow Participants to Post Collateral Based on Maximum Potential Exposure of Bids

Example: Collateral Requirements of a Single Path (assuming same tenor and product type)



	Bid Volume (MWh)	Bid Price ($/MWh)	Current Collateral Requirement ($)	Collateral Requirement if All Bids Clear at Lowest Bid of $0.30/MWh ($)
Bid 1	200	$0.50	$100	$60
Bid 2	600	$0.40	$240	$180
Bid 3	1,000	$0.30	$300	$300
Total	**1,800**		**$640**	**$540**

- Market participant credit limits referenced by the CRR auction engine are based on the sum of all bids
- This overstates the maximum credit exposure when multiple bids are submitted for the same path (assuming same tenor and product type)
- For bids such as these the actual maximum credit exposure would be equal to the sum of all volumes multiplied by the lowest bid price
  - Equal to $540 in the example (shaded area on chart)
- This can be solved by introducing a pre-auction collateral screening process that checks for maximum potential collateral exposure
  - Market participants who meet this criteria will then have an infinite credit limit set in the CRR auction engine
- ***This is an additional step that does not change the way the current CRR engine optimizes for credit***

Potential Recommendations for WMS

- **Implement process to use mark to market exposure to collateralize awarded CRR's in forward delivery months**

- **Develop two stage process for calculating initial margin adder to mitigate intra auction risk**
  - Long term goal (when enough historical data becomes available) for calculating price risk between auctions likely to be based on a Monte Carlo type simulation based on forward CRR auction prices.
  - In the interim, develop an adder that appropriately covers intra-auction risk
  - It is envisioned that both the long term solution, as well as the interim solution, would be based on a TAC approved process

- **Implement process to allow pre-auction collateral screening process**

- **Allow expected CRR revenue for QSE's with load to offset collateral obligations for prompt month only (exclude forward months from this)**

APPENDIX

Example: Event of Default

Event			
Dec '11 CRR Auction	Awarded Jul '12 CRR Volume	MWh	1,000
	Awarded Jul '12 CRR Price	$/MWh	$ 3.00
	Fwd Mth Initial Margin Adder	$/MWh	$ 0.50
	July '12 CRR Collateral Requirement	$	$ 500
	Expected CRR Revenue to Load	$	$ 3,000
Jan '12 CRR Auction	Awarded Jul '12 CRR Volume	MWh	1,000
	Awarded Jul '12 CRR Price	$/MWh	$ 3.00
	New Auction Clearing Price for Jul '12	$/MWh	$ 2.75
	Jul '12 Mark to Market Exposure	$	$ (250)
	Revised July '12 CRR Collateral Requirement	$	$ 750
	Expected CRR Revenue to Load	$	$ 3,000
Mkt Participant Defaults	Collateral Previously Collected	$	$ 500
	Collateral Exposure	$	$ 250
Jan '12 CRR Auction	Volume Available for re-auction	MWh	1,000
	New Auction Clearing Price for Jul '12	$/MWh	$ 2.60
	Expected CRR Revenue to Load	$	$ 3,000
	Revenue collected from re-auctioned volume	$	$ 2,600
	Collateral collected from defaulting party	$	$ 500
	Uplift cost to ERCOT participants		$ -

- Initial Margin represents both price and state change risk between auction periods
- Represents expected revenue to load from auction for the 1,000 MWh awarded
- New auction clearing price of $2.75/MWh means previously awarded CRR is out of the money, therefore has to post an additional $250 of collateral
- If market participant defaults at this stage, ERCOT would have $500 of collateral with $250 still owed
- Original volumes now available for auction again
- New auction price means that load still needs $400 to be made whole
- Original $500 initial margin collected makes up difference such that no uplift cost to market

To the extent that initial margin adder does not cover price movement between auction, potential uplift risk will exist

Example – Timeline of Collateral Requirements

					Jan	Feb	Mar	Apr → Mth 12
December	Pre-Auction Activities	Credit Lock Collateral	Bid Volume	MWh	1,000	800	500	-
			Bid Price	$/MWh	$ 3.50	$ 3.50	$ 3.50	$ -
			Collateral Adder	$/MWh	$ 0.75	$ 0.50	$ 0.50	
			Total Collateral	**$**	**4,250**	**400**	**250**	**-**
	Auction		***Clearing Price***	***$/MWh***	***$ 3.00***	***$ 3.00***	***$ 3.00***	***$ 3.00***
	Post Auction Collateral	Awarded CRR Collateral	Awarded Volume	MWh	1,000	800	500	-
			Awarded Price	$/MWh	$ 3.00	$ 3.00	$ 3.00	$ -
			Collateral Adder	$/MWh	$ 0.70	$ 0.50	$ 0.50	
			Total Collateral	**$**	**$ 3,700**	**400**	**250**	**-**
	Settlement		**Invoice Payment**	**$**	**$ 3,000**	**$ -**	**$ -**	**$ -**
	Intra Auction Collateral		Awarded Volume	MWh	1,000	800	500	
			Collateral Adder	$/MWh	$ 0.70	$ 0.50	$ 0.50	
			Total Collateral	**$**	**700**	**400**	**250**	**-**
January	Pre-Auction Activities	Dec Collateral Requirements	DAM Risk Collateral	$	$ 350	$ -	$ -	$ -
			Prompt Mth Collateral	$	$ -	$ 3,000	$ -	$ -
			Fwd Mth Collateral	$	$ -	$ -	$ 250	$ -
			Total Collateral		**$ 350**	**$ 3,000**	**$ 250**	**$ -**
		Jan Credit Lock Collateral	Bid Volume	MWh	-	200	100	50
			Bid Price	$/MWh	$ -	$ 3.00	$ 3.00	$ 3.00
			Collateral Adder	$/MWh	$ -	$ 0.75	$ 0.50	$ 0.50
			Total Collateral	**$**	**-**	**750**	**50**	**25**
			Total Collateral	**$**	**$ 350**	**$ 3,750**	**$ 300**	**$ 25**
	Auction		***Clearing Price***	***$/MWh***		***$ 2.75***	***$ 2.75***	***$ 2.75***
	Post Auction Collateral	Dec Collateral Requirements	Notional Collateral	$		$ 2,960	$ -	$ -
			Fwd Collateral	$			$ 250	$ -
			MtM Exposure	$		$ -	$ 125	$ -
			Total	$		**$ 2,960**	**$ 375**	**$ -**
		Jan - Awarded CRR Collateral	Awarded Volume	MWh		200	100	50
			Awarded Price	$/MWh		$ 2.75	$ 2.75	$ 2.75
			Collateral Adder	$/MWh		$ 0.70	$ 0.50	$ 0.50
			Total	**$**		**690**	**325**	**163**
			Total Collateral	**$**		**3,650**	**700**	**163**
	Settlement		Dec Activity Invoice	$		$ 2,400	$ -	$ -
			Jan Activity Invoice	$		$ 550	$ -	$ -
			Total	**$**		**$ 2,950**	**$ -**	**$ -**
	Intra Auction Collateral		Awarded Volume	MWh		1,000	900	550
			Collateral Adder	$/MWh		$ 0.70	$ 0.50	$ 0.50
			Total Collateral	**$**		**$ 700**	**$ 450**	**$ 275**

$ 0.70	Weighted DAM Risk Adder
$ 0.75	Pre-Auction Prompt Mth Adder
$ 0.50	Fwd Mth Adder

- Prompt month fully collateralized at bid price plus prompt mth adder as no further opportunity to run auction
- Forward adder ("Initial Margin") used to collateralize forward month bids

- Prompt month fully collateralized at awarded price plus adder to reflect DAM market settlement risk
- Continue to post Initial Margin for forward months to mitigate risk of intra-month price change

- Settlement of prompt month only

- In period between auctions continue to post collateral in prompt month to reflect DAM settlement risk – volume starts rolling off in delivery month
- Forward months continue to be collateralized at Initial Margin adder

- Continue to post collateral in delivery month to reflect DAM settlement risk – example assumes 50% of mth rolled off
- Awarded volumes for Feb in Dec auction now become prompt month and are collateralized at notional value plus prompt mth adder
- Mar volumes continue to be collateralized by Initial Margin

- Incremental capacity released for Jan auction - pre-auction bids/offers are collateralized in the same way as in Dec auction

- Prompt mth (Feb) now collateralized at awarded price plus adder to reflect DAM market settlement risk
- New clearing price for Mar means that Mar volumes awarded in Dec are now $0.50/MWh out of the money. Therefore additional collateral is needed for this exposure

- Settlement of Feb awarded volumes in both the Dec, and Jan auctions

- In period between auctions continue to post collateral in prompt month to reflect DAM settlement risk – volume starts rolling off in delivery month
- Forward months continue to be collateralized at Initial Margin adder