

ARR/FTR Market Design and Design Components: IMM Proposals

AFMTF

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The Purpose of the ARR/FTR Design

- **The purpose of the ARR/FTR design is to return congestion to load.**
- **Congestion is the surplus payment by load that results from differences in LMP in a transmission constrained system.**
- **Congestion is the surplus after generation is paid and virtuals are settled.**
- **Congestion is paid by load.**

ARR/FTR Market: Current Issues

- **ARR rights assigned on a historic generation to load path basis do not align with actual network use.**
 - **Realized and available offset varies widely among customers**
- **Not all congestion paid by load can be claimed by ARR holders.**
 - **Self scheduling all allocated ARR rights would have returned less than 62 percent of congestion in the last three planning periods (17/18, 18/19 and 19/20)**
- **FTRs are available on paths that do not correspond to physical load service and do not collect congestion.**
 - **Over 50 percent of FTR MW are generator node to generator node**

ARR/FTR Market: Current Issues

- **The result is significant differences between the allocation of congestion revenue rights and the actual payment of congestion.**



Fundamental Issues

- **Load has no effect on the amount or location of FTRs available for sale**
 - Price discovery cannot occur without participants on the supply side
- **Cross subsidies among and between ARR and FTRs**
 - **Reduced capability available**
 - **Cannot exchange rights for fixed revenue stream**
 - **Infeasible Stage 1A rights**
 - **FTRs on paths that do not align with ARR rights and/or the actual payment of congestion**

Solution: Replace Fixed Path Right with Actual Congestion Right

- **Convert from allocations of fixed contract paths to rights based on actual congestion**
- **Actual congestion includes both day-ahead and balancing**

Proposed Design of ARR/FTR Market

- **Each LSE has the option to receive all congestion revenues it pays during a month, no more and no less, by bus.**
 - **DA + Balancing**
 - **Option can never have a negative value**
 - **Default option is the return of congestion paid to the load that paid it**

Proposed Design of ARR/FTR Market

- **Each LSE has the option to sell the rights to the variable congestion revenue in return for a fixed payment, the Network Financial Transmission Right (NFTR).**

Proposed Design of FTR Market

- **LSE would have control of what is sold and the price at which it was sold**
 - **Each LSE can sell zero to 100 percent of its own congestion by bus or zone.**
 - **Reserve prices set by LSE**
- **Each LSE has the option to sell its congestion rents**
 - **As path based FTRs**
 - **Auction (PJM or third party platform)**
 - **Bilateral**
 - **Risk limited to the selling LSE**
 - **No cross subsidies among rights holders**

Proposed Design of FTR Market

- **Certainty about return of actual congestion paid**
- **No hold back of system capability to guarantee FTR funding**
- **No end of year surplus allocation needed**
 - **No surplus exists if all rights are allocated**



Proposed Design of FTR Market

- **No cross subsidies among LSEs**
 - **All congestion collected by bus**
- **Return of actual congestion paid means:**
 - **Rights to congestion are always positive in value to the recipient**
 - **No flip of path value (cannot go from positive to negative)**
 - **No cross subsidies caused by path specific approach and binary outage modeling or primary rights.**

Proposed Design of FTR Market: Lower Credit Risk Relative to Current Model

- **Elimination of path based system eliminates risk inherent in current design:**
 - **No paths: No cross subsidies among rights**
 - **Bankruptcy of a buyer does not affect congestion revenues or other sellers of congestion rights**
 - **If a buyer is bankrupt, congestion rights revert to owner**
 - Owner only loses revenue stream from buyer
 - Owner can resell right
 - No effect on other positions
 - No tax on membership to support remaining FTR holders

Current ARR/FTR Does Not Meet Primary Goal

Issue	Status Quo	IMM Proposal
ARR rights do not align with actual network use. Load cannot reclaim congestion paid.	Only 62 percent of congestion is claimable by ARR holders.	100 percent of congestion is claimable by those that pay it. Rights to all congestion assigned to the load that pays it, based on actual network congestion DA and RT.
ARR rights do not align with actual network use. Load cannot reclaim congestion paid.	Specified sources and sinks based on historic source points. Limitations on source point selection. Does not match network. Creates cross subsidies among ARR holders and misalignment of ARR rights.	Rights to all congestion assigned to the load that pays it, based on actual network congestion DA and RT. Automatically accounts for changing system conditions over time.

Current ARR/FTR Does Not Meet Primary Goal

Issue	Status Quo	IMM Proposal
Load cannot claim all congestion paid.	Annual Model with modeled constraints, line limits and outages based on DA snapshot. Monthly updates during planning year. Objective to guarantee target allocation payouts. Creates congestion surplus as insurance, at the cost of ARR holders, to guarantee FTR payouts.	Actual DA model and RT model of every actual market interval and hour. Congestion returned equals actual congestion paid.
Load cannot claim all congestion paid.	Auction surplus generated by unallocated source and sink pairs not claimed or claimable by ARR holders. Auction surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	All rights are assigned. All rights are claimable. No unassigned rights. More revenues are directly available to ARR holders.
Load cannot claim all congestion paid.	Congestion surplus generated by unsold system capability not directly available or claimable by ARR holders and/or not made available in the FTR auctions. Congestion surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	All rights are assigned. All rights are claimable. No unassigned rights. More revenues are directly available to ARR holders.

Current ARR/FTR Does Not Meet Primary Goal

Issue	Status Quo	IMM Proposal
ARR holders cannot sell congestion rights.	Annual, 24H Obligation price taker from average 4 round annual auction prices. No first rights to surplus.	Set price for the sale of any portion of congestion revenue rights for a given period.

Matrix-ARR

#	Track/Theme	Design Components ¹	Priority	Status Quo	IMM Proposal
1	1. ARR	Availability and Assignment of Congestion rights to Load		Stage 1 – source points only from designated active historical resources or Qualified Replacement Resources Stage 2 – source points any available generator, interface, hub, zone Must always sink at load settlement point/aggregate	Rights to all congestion allocated to the load that paid it, based on actual network congestion DA and RT Rights to all congestion allocated to the load that paid it, based on actual network congestion DA and RT
1a.		Allocation mechanism			
1b.		ARR nomination point availability			Physical load points/export interface
2		Congestion Right Election (Claim or Sell Options)		Annual, 24H Obligation "Price taker" from average 4 round annual auction prices	Set reserve prices for the sale of any portion of congestion that will be paid in a given period.
3		Auction Surplus		Auction surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	NA, All rights are assigned, no unassigned rights
4		Congestion Surplus		Congestion surplus goes to FTR deficiencies first, residual allocated to ARR holders on ARR weighted basis	NA. All rights are assigned, no unassigned rights.
5		Model details		Annual Model with modeled constraints, line limits and outages based on DA snap shot, Monthly updates during planning year. Objective to guarantee target allocation payouts.	Actual DA model and RT model of every actual market day
6		Amount of guaranteed ARRs		Stage 1A up-to ZBL share on historical source and sink paths only.	Full congestion paid in planning year.
7		Incremental ARR product types		EE, Merchant, RTEP	Eliminate IARR, inconsistent with network use.
7a.		IARR model development and SFT assumptions and procedures		Model document available here: https://www.pjm.com/-/media/markets-ops/ftr/pjm-iarr-model-development-and-analysis.ashx	Eliminate IARR, inconsistent with network use.

Matrix-FTR

#	Track/Theme	Design Components ¹	Priority	Status Quo	IMM Proposal
8	2. FTRs	FTR Auction bid limits		10,000 per period, auction, round by corporate entity	NA
9		FTR Option paths and clearing mechanism		Path availability limited by historical pricing and source/sink node type. Price calculated for all eligible Option paths.	All rights are options, no negative values possible
10		Invalid FTR Paths		FTR paths that clear with < 0.1% impact on any constraint not cleared. FTRs with a zero clearing price will only be awarded if there is a minimum of one binding constraint in the auction period for which the FTR path sensitivity is non-zero (0.1% threshold).	None.
11		FTR product & class types		24H, On peak, Off peak (M-F 2300-0700, Weekend all day). Monthly or Annual product.	Product types for congestion made available to market would match what was sold by rights holders. Product types can be as flexible as requested by the market.
12		Bilateral transaction functionality		Post, Accept, Confirm. Indemnification from defaults	All bilateral arrangements must be on a PJM platform subject to PJM credit criteria.
13	Source of Congestion dollars allocated to FTRs		DA ahead only, balancing and M2M assigned to load on load ratio basis.	All congestion (DA+Balancing+M2M)	
14	Available Rights not allocated or directly claimable by load (FTR Biddable points)			Paths not associated with ARR source and sink pairs (sets)	NA
15	FTR Forfeiture Rule			Flow based, per M-6 section 8.6	NA

Matrix-Transparency

#	Track/Theme	Design Components ¹	Priority	Status Quo	IMM Proposal
16	3. Transparency and Simplicity	Network model posted information		Base topology, outages, selected interface limits, m2m flow, loop flow, uncompensated flow, contingencies modeled	Actual DA model and RT model of every actual market day. OASIS.
17		Network model posting frequency		Base models posted quarterly; outages, interface limits posted per auction, aggregate and PAR definitions, model mapping files	OASIS
18		Outage modeling		Binary outages, entire model period	Actual by Day
19		Bid submission upload capability Implementation date		Bids can be submitted through FTR center, or browserless via XML. N/A	

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