



# Updates to Regional Transmission and Energy Scheduling Practices



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- MIC
  - First Read 7/12/17 (Complete)
  - Endorsement 8/9/17 (Complete)
- MRC
  - First Read 7/27/17 (Complete)
  - Endorsement 8/24/17

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## Seeking endorsement of proposed updates to the PJM Regional Transmission and Energy Scheduling Practices:

- Updates from the MISO-PJM Coordinated Transaction Scheduling (CTS) effort that outline the rules applicable to CTS Bid submission and validation
- Updates from alignment with the Intra-day Hourly Offers effort to change the ExSchedule Dispatchable Schedule Submission Timelines
- Updates resulting from the NAESB eTag Specification 1.8.3 change that introduces the Market Operator role to Tags

**No changes since first read**

## Modified:

- 2.1.2.2 Interchange Schedule Timing Requirements
  - Added CTS Bid timing requirements
- 2.1.2.4 Ramp Limits
  - Added clarification on the timing of the CTS transaction ramp evaluation
- 2.1.2.10 Ramp Reservations
  - Clarified the relationship between CTS transactions and Ramp Reservations

## Modified:

- 2.1.2.14 PJM-MISO Coordinated Transaction Scheduling
  - New section containing scheduling business rules introduced for CTS
- 2.2.1 Data Requirements
  - Added CTS Price/Energy input requirement
- 2.2.2 Data Validations
  - Described Bid and Tag validations related to CTS
- 2.2.6 PJM-MISO Coordinated Transaction Scheduling Evaluation and Checkout
  - New section to capture CTS evaluation process

## Modified:

- 2.1.2.2 Interchange Schedule Timing Requirements
  - Outlined when Dispatchable MW and Price values can be changed
- 2.1.2.11 Dispatchable Interchange Schedule
  - Clarified when Dispatchable Tags must be submitted to match the Dispatchable Reservation and when they must be submitted at 0 MW

## Modified:

- 2.2.2 Data Validations
  - Added Market Operator requirement per NAESB eTag Specification v1.8.3

# Reference – Language Changes





## 2.1.2.2 Interchange Schedule Timing Requirements

The following timing requirements are imposed by PJM for the submission of Ramp Reservations:

- Ramp Reservations may be submitted up to 30 minutes prior to the reservation start time.
- Ramp Reservations can be modified up to 30 minutes prior to the modification start time.
- Dispatchable Reservations must be submitted prior to 18:00 EPT one day prior to the reservation start time.
- Dispatchable Reservation MW and Price values may be modified as long as the submission occurs no later than 65 minutes prior to the modification start time.
  - Modifications to the duration of the Dispatchable Reservation will not be permitted after the 18:00 EPT one day prior submission deadline.
  - ~~Dispatchable Reservations cannot be modified after the submission deadline.~~

Ramp Reservations and Dispatchable Reservations expire if they are not attached to an Approved Tag. Regardless of the reservation duration, when the expiration threshold is met, the entire reservation

The following timing requirements are imposed by PJM for the submission of Coordinated Transaction Scheduling (CTS) Bids along the PJM-MISO Interface:

- CTS Bids may be submitted up to 75 minutes prior to the transaction start time.
- Modifications to CTS Bids may be submitted up to 75 minutes prior to the modification start time.
- CTS Bids must be linked to an Approved Tag at least 75 minutes prior to the bid's start time or the bid will expire. Similarly, CTS Bid modifications must be reflected on the Approved Tag at least 75 minutes prior to the modification start time or the modified CTS Bid will expire, leaving the original CTS Bid intact.

## 2.1.2.4 Ramp Limits

PJM validates all Interchange Schedule requests against a net interchange ramp limit. This validation occurs at the time of submission or modification of a Ramp Reservation or a Tag, with the exception of Dispatchable Reservations on all interfaces and Tags scheduled across the NYISO interface. Dispatchable Reservations and Ramp Reservations associated with PJM-MISO CTS transactions are validated prior to curtailing or reloading the Tag or as part of the Tag Adjustment validation process ~~the Tag~~. Tags scheduled across the NYISO interface will be validated only after NYISO has initiated an economic evaluation and has issued the preliminary results of that evaluation. The net interchange ramp limits may be modified by PJM system operators based on their evaluation of current and expected operating conditions.

### 2.1.2.10 Ramp Reservations

Ramp Reservations are required for all Tags and enable market participants to secure the ramp availability needed to create or modify an Interchange Schedule. For normal Interchange Schedules, ~~M~~market participants have the option to either create a Ramp Reservation in advance of submitting the Tag or to allow PJM to attempt to create the reservation on the participant's behalf at the time of Tag submission. Ramp Reservations are generally created in advance of Tag submission in order to ensure the ability to schedule prior to purchasing Transmission Service or making other potentially cost affecting decisions. For CTS transactions, market participants may not create their own Ramp Reservations and must wait for PJM to create the reservation as part of the Tag approval process.

When a Tag is submitted without an attached Ramp Reservation, PJM will attempt to create a reservation that matches the Tag's path and the energy profile. For normal Interchange Schedules, ~~t~~this automatically created Ramp Reservation will be evaluated against the applicable ramp limits. For CTS transactions, this automatically created Ramp Reservation will be created with a 0 MW energy profile to cover the duration of the CTS Bid. If the reservation is successfully created it will be associated with the Tag and PJM will continue with the remaining Tag validations. Ramp Reservations created automatically via Tag submission may be viewed in ExSchedule.

## 2.1.2.11 Dispatchable Interchange Schedules

Dispatchable Interchange Schedules differ from normal Interchange Schedules in that the creation of a Dispatchable Reservation in advance of Tag submission is not optional. Market participants must create a Dispatchable Reservation in ExSchedule that associates a price with each energy block and then manually attach the reservation to their Tag.

Because Dispatchable Reservations contain price information associated with each energy block, PJM is unable to adjust the Dispatchable Reservation to mirror the Tag when there is a mismatch between them. The Dispatchable Reservation must be modified prior to the submission of a matching Tag adjustment.

- Dispatchable Tags submitted on all interfaces, with the exception of NYISO, must have a Tag energy profile of 0 MW and a Tag transmission profile matching the Dispatchable Reservation.
- Dispatchable Tags associated with the NYISO interface must have a Tag energy profile that matches the Dispatchable Reservation.

~~Unlike Ramp Reservations, Dispatchable Reservations must match the Tag energy profile exactly in order for the Tag to be approved. Because price information has been associated with the reservation, PJM will not attempt to adjust the reservation energy profile to match the Tag energy profile. Upon Implementation of the Tag, PJM will curtail the Tag to 0 MW in preparation for the real time loading/unloading of the transaction.~~

## **2.1.2.14 PJM-MISO Coordinated Transaction Scheduling**

Coordinated Transaction Scheduling (CTS) is an optional product intended to facilitate the efficient scheduling of interchange by utilizing forecast LMPs to enable a coordinated clearing process between PJM and MISO. In order to participate, Market participants must use PJM's ExSchedule application to create a bid that specifies the price differential between PJM and MISO that would be sufficient for the participant to flow an interchange schedule between the PJM and MISO Balancing Authorities. CTS Bids can then be attached to a Tag by placing a specialized Token/Value pair in the Misc. Info column of the Generating Control Area line in the Physical Path of the Tag. The Token entry should be "BID" and the Value entry should be the CTS Bid ID obtained from ExSchedule.

Once the CTS Bid has been linked to an Approved Tag, the bid is factored into a process by which PJM and MISO jointly determine which Tags are eligible to flow. Based on that output, PJM and MISO will modify the Tags to match the MW output set by the cleared CTS Bid.

PJM and MISO leverage the Market Adjustment Tag Request type to ensure CTS Tags are modified to flow at the economically cleared MW amount. The Market Adjustment of a Tag requires approval by several impacted entities, including the Tag's Purchasing Selling Entity. As such, the CTS market participant has an obligation to approve all CTS Tag Market Adjustments, and to ensure that the approvals are supplied in a timely manner. A Market Participant's consistent failure to approve CTS Tag Market Adjustment requests could lead to suspension of the participant's right to submit CTS transactions. All observed cases of inappropriate behavior, including failure to approve CTS Tag Market Adjustments, will be reported to PJM's Independent Market Monitor.

## 2.2.1 Data Requirements

Market participants are expected to keep PJM informed of all Interchange Schedules that involve the operation of the PJM RTO. The following information is submitted to PJM via eCredit, ExSchedule, and the market participant's Tag agent service.

- eCredit
  - Credit Available for Export Transactions per Attachment Q of the PJM Open Access Transmission Tariff
- ExSchedule
  - NAESB Electric Industry Registry (EIR) Entity Code
    - Market participants must supply PJM with the EIR Entity Code that will be used to submit Tags. PJM uses this code to establish Tag ownership and to link Tags to a PJM Organization ID
    - An EIR Entity Code may only be linked to a single PJM Organization ID at any given time
    - Multiple EIR Entity Codes may be linked to a single PJM Organization ID
  - Price/energy profile associated with a Dispatchable Reservation
  - Price/energy profile associated with a PJM-MISO Coordinated Transaction Scheduling (CTS) Bid

## 2.2.2 Data Validations

- Syntax validation (See NAESB Electronic Tagging Functional Specification)
- Physical Path
  - PJM must be listed as the LCA for Imports
  - PJM must be listed as the GCA for Exports
  - PJM must not be listed as the GCA or LCA for Wheels
  - PJM must not be listed as both the GCA and LCA
  - PJM may not be listed as a TP on multiple lines
  - As applicable, the TP lines preceding or following the PJM TP line must be Transmission Providers adjacent to PJM
  - PJM must be listed as the Market Operator on the PJM TP line
  - The POR and POD listed on the PJM TP line must match both the Ramp Reservation Path and the Transmission Service Path
  - Token/Value Pairs
    - For normal Tags, Only one Token/Value pair of each type may be listed (RAMPRES, EXCEPTION, ZONE)
    - For CTS Tags, the BID Token/Value pair must be listed on the GCA row of the Tag's Physical Path section. When the BID token is present, only the ZONE token is eligible to also be listed on the PJM TP line.
    - Ramp Reservations may only be associated to one Tag
- Energy Profile
  - All MW changes must occur on a quarter-hour interval
  - Start and stop times must be in the future
  - Ramp duration must be omitted or set to 10 minutes
  - CTS Tags must contain a 0 MW Energy Profile for all intervals defined on the associated Bid.

## 2.2.2 Data Validations

- Transmission Profile
  - Transmission Service allocated to each interval must be valid for the entire interval and must equal or exceed the energy profile MW value
  - Transmission Service allocation across all Tags referencing a certain Transmission Service reservation may not exceed
    - the total MWh capacity of the reservation
    - the instantaneous capacity of the reservation in any given interval
  - Market participants may not vertically stack Transmission Service on a Tag
  - CTS Tags must contain a Transmission Profile whereby the amount of Transmission Service allocated to each interval is sufficient to accommodate the maximum MW bid point- on the CTS Bid for that interval

## 2.2.2 Data Validations

On submission, the following validations are performed for CTS Bids:

- Timing requirements (per Section 2.1.2.2 Interchange Schedule Timing Requirements)
- Bid may be defined in only one direction
  - Market Path is valid for the duration of the CTS energy profile
- Energy profile
  - Stop time after start time
  - Start and stop times must be in the future
  - Bid must be at least 15 minutes in duration, and no greater than 25 hours in duration
  - All MW values should be non-negative integers
  - All MW changes must occur on a quarter-hour interval
  - At least one MW/Price pair must be associated with each interval
  - An interval may have no more than 10 MW/Price pairs
  - All Bid prices must be greater than or equal to \$0.01.
  - Each MW/Price pair must increase both the MW and Price values as compared to the previous pair



## -2.2.6 PJM-MISO Coordinated Transaction Scheduling Evaluation and Checkout

PJM-MISO CTS Schedules are verified differently than traditional Interchange Schedules. These CTS schedules are evaluated by PJM and MISO's market systems to determine whether the schedule should be loaded. This evaluation is performed on a 15 minute scheduling interval basis. When it is determined that the economics for the schedule warrant the Tag to be loaded or unloaded, the Tag will be modified by PJM or MISO depending on which serves as the transaction's sink BA. Once a PJM-MISO CTS Tag has been loaded, it will be subject to the Neighboring Balancing Authority checkout process before it will flow.