



Manual 11 Attachment C: PJM Procedure for Cost Reimbursement

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- At the September 4, 2014 PJM Operating Committee: Gas Unit Commitment Coordination Meeting stakeholders requested education on schedule switching as it exists in PJM rules today
 - When can units switch schedules?
 - Where are the rules on this?
 - When does PJM use Price-Based Parameter-Limited schedules?

Scenario 1	Day-ahead commitment
Scenario 2	Day-ahead commitment: extended w/ schedules
Scenario 3	Day-ahead commitment: extended w/out schedules
Scenario 4	Called on during the Reliability Assessment and Commitment run
Scenario 5	Real-time commitment
Scenario 6	Long Lead time Unit with time to start \geq 36 hours

- Manual 11: Attachment C: **Purpose**

Enable units that are requested to remain online by PJM System Operations **past their initial, day-ahead commitment** and in order to do so are forced to procure fuel at a higher cost than that on which their day-ahead or the Reliability Assessment (Rebid Period) offer was based, to better manage the risk associated with the additional costs associated with that operation. This procedure is not intended to guarantee cost recovery nor is it intended to address lost opportunity, profit maximization, or normal Operating Reserves make-whole payments where no change in fuel cost was experienced.

- Manual 11: Attachment C: **Operations**

If a unit has been asked to **extend its hours of operation in real time** and the unit has a limited fuel supply and must utilize higher priced fuel to remain online, the participant must inform the PJM system operator of the fuel cost change by requesting the real-time offer to be switched to one of the additional available schedules. The participant must verify that the new schedule is the one reflecting fuel costs closest to those that will be actually paid to operate for the extended hours requested. The PJM operator will evaluate whether the higher cost schedule is economic and if so, will log and dispatch the unit on the new schedule.

- Unit XYZ offers daily into the Day-Ahead Market
 - Has a heat rate of 10
 - Offers one price schedule
 - Has calculated many cost schedules (78) at different gas prices and the cheapest one offered is actual expected cost
 - Expected gas cost at the time of Day-Ahead Market close:
 - \$10/mmbtu
 - Price offer \$100/MWh

** please note that cost offer development here is being over simplified, for more information please see PJM Manual 15: Cost Development Guidelines and the PJM tariff



Examples of cost offers (simplified)

Cost Schedule Name	Gas Price	Offer	Available
A	\$ 2	\$ 20	Y
B	\$ 5	\$ 50	Y
C	\$ 7	\$ 70	Y
D	\$ 8	\$ 80	Y
E	\$ 10	\$ 100	Y
F	\$ 15	\$ 150	Y
G	\$ 20	\$ 200	Y
H	\$ 25	\$ 250	Y
I	\$ 30	\$ 300	Y
J	\$ 40	\$ 400	Y
K	\$ 50	\$ 500	Y
L	\$ 60	\$ 600	Y
M	\$ 70	\$ 700	Y
N	\$ 80	\$ 800	Y
O	\$ 90	\$ 900	Y
P	\$ 100	\$ 1,000	Y

Cost Schedule Name	Gas Price	Offer	Available
A	\$ 2	\$ 20	Y
B	\$ 5	\$ 50	Y
C	\$ 7	\$ 70	Y
D	\$ 8	\$ 80	Y
E	\$ 10	\$ 100	Y
F	\$ 15	\$ 150	Y
G	\$ 20	\$ 200	Y
H	\$ 25	\$ 250	Y
I	\$ 30	\$ 300	Y

Set all schedules less than \$100 to unavailable

Cost Schedule Name	Gas Price	Offer	Available
A	\$ 2	\$ 20	N
B	\$ 5	\$ 50	N
C	\$ 7	\$ 70	N
D	\$ 8	\$ 80	N
E	\$ 10	\$ 100	Y
F	\$ 15	\$ 150	Y
G	\$ 20	\$ 200	Y
H	\$ 25	\$ 250	Y
I	\$ 30	\$ 300	Y

- If the unit receives a day-ahead commitment then regardless of where actual costs fall the unit is committed and will receive energy revenues and make-whole to the offer on which the unit was committed
 - Actual gas cost comes in less than \$10 – unit may profit
 - Actual gas cost comes in more than \$10– unit may lose money

- If the unit receives a Day-ahead commitment then regardless of where actual costs fall the unit is committed and will receive energy revenues and make-whole to the offer on which the unit was committed.

HOWEVER

- If the unit is requested to be extended past the day-ahead commitment.

AND

- The unit has available cost schedules that reflect the new cost.
- The unit owner can specify which schedule best represents the cost.

1. PJM requests unit runtime be extended
2. New higher estimated fuel cost (example \$15/mmbtu gas)
3. Unit requests a different AVAILABLE cost schedule
4. PJM evaluates and decides
5. If PJM chooses to keep the unit on; owners must send email per M11 Attachment C by noon the next day

Cost Schedule Name	Gas Price	Offer	Available
A	\$ 2	\$ 20	N
B	\$ 5	\$ 50	N
C	\$ 7	\$ 70	N
D	\$ 8	\$ 80	N
E	\$ 10	\$ 100	Y
F	\$ 15	\$ 150	Y
G	\$ 20	\$ 200	Y
H	\$ 25	\$ 250	Y
I	\$ 30	\$ 300	Y

if a unit has been asked to extend its hours of operation in real time and the unit has a limited fuel supply and must utilize higher priced fuel to remain online, the participant must inform the PJM system operator of the fuel cost change by requesting the real-time offer to be switched to one of the additional available schedules. **Give PJM system operator the Schedule Name and Schedule Description from Schedule Manager Page**

Unit | **Schedules** | Dispatch Lambda | Market Results | Regulation Market | Synchronized Reserve Market | Nonsynchronized Reserve Market | DA Scheduling Reserve Market | Con Ed | Parameter Limits | Interface Pricing | Opportunity Cost Calculator

Schedule Offers | Schedule Detail | **Schedule Manager** | Schedule Selection

Schedule Manager

Portfolio: Unit:

Pages: 1 Records: 1 - 3 of 3 matches.

Schedule Manager for

<input type="checkbox"/>	Schedule Name	Schedule Description	Schedule Type
<input type="checkbox"/>	SGAS	Lucky Start CT SGAS	05-Cost-PLS
<input type="checkbox"/>	CGAS	Lucky Start CT CGAS	06-Cost-PLS
<input type="checkbox"/>	KERO	Lucky Start CT Kero	11-Cost-PLS

Participants who have been asked by PJM to extend a unit's run time and in order to comply with that request procured higher cost fuel have until 12:00 noon on the following business day to submit an e-mail to market_bids@pjm.com with the following information:

- Unit Name
- Date of operation
- Time of extended operation
- ID number of new schedule
- Name of new Schedule
- Contact information (name of sender, phone, e-mail)
- Date and time of PJM Dispatch contact to generator
- Actual marginal cost of unit considering the actual cost of the fuel procured to continue operating

- If the unit receives a day-ahead commitment then regardless of where actual costs fall the unit is committed and will receive energy revenues and make-whole to the offer on which the unit was committed
- HOWEVER
- If the unit is requested to be extended past the day-ahead commitment, the unit owner can specify which schedule best represents the cost
- **BUT if the unit does not have any available cost schedule the unit must run on the current schedule**

Cost Schedule Name	Gas Price	Offer	Available
A	\$ 2	\$ 20	N
B	\$ 5	\$ 50	N
C	\$ 7	\$ 70	N
D	\$ 8	\$ 80	N
E	\$ 10	\$ 100	Y
F	\$ 15	\$ 150	N
G	\$ 20	\$ 200	N
H	\$ 25	\$ 250	N
I	\$ 30	\$ 300	N

- If the unit is called on during the Reliability Assessment and Commitment (RAC) run then regardless of where actual costs fall the unit is committed and will receive energy revenues and make-whole to the offer on which the unit was committed
 - Actual gas cost comes in less than \$10 – unit may profit
 - Actual gas cost comes in more than \$10– unit may lose money

- If the unit is called in real time then regardless of where actual costs fall the unit is committed and will receive energy revenues and make-whole to the offer on which the unit was committed
- Actual gas cost comes in less than \$10 – unit may profit
- Actual gas cost comes in more than \$10– unit may lose money
- **The unit must run on the PJM chosen available schedule**

- If a unit is called on before the Day-Ahead Market and has longer than 36 hours time to start (TTS). PJM will mitigate (offer cap) the unit at the lower of the price based schedule or the lowest available cost-based schedule.
- **The unit must run on the PJM chosen available schedule**

- 2.3.3- Market Sellers: The following business rules apply to Market Sellers:

Each Generation Capacity Resource must make available at least one cost-based schedule and if it falls within the types of generators in the PJM Unit Parameter matrix it must also submit a Price Based Parameter Limited Schedule.

Two single price-based schedules may be offered into the Day-ahead Market. **One schedule must be a price based parameter limited schedule. The price-based parameter-limited schedule may be unavailable, and if it is, the "use max gen" flag must be set to "yes". The price-based parameter limited schedule will be committed during Maximum Generation Emergency if it is unavailable in the Day-Ahead Market and the "use max gen" flag is set to "yes".** The second price schedule is a price-based schedule that is not parameter limited. One of these two price schedules must be available in the Day-Ahead Market. In addition to the price-based schedule, one cost-based schedule shall be made available for PJM's use in the event that the resource is used to control a transmission constraint. The cost-based schedule shall be parameter-limited.

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- **2.3.4 Minimum Generator Operating Parameters – Parameter Limited Schedules**

Below is the list of business rules to require units to submit schedules that meet minimum accepted parameters:

Market Sellers with price based generation resources will be required to submit three schedules, per Section 2.3.3 of this Manual, as follows: (1) a cost based parameter limited schedule, (2) a price based schedule, and **(3) a price based parameter limited schedule**. Only the cost based parameter limited schedule and the **price based parameter limited schedule** must follow the predefined parameters in the Parameter Limited Schedule Matrix or approved parameter exceptions.