

Reserve Performance Obligations

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- The purpose of this presentation is to clarify what performance obligations resources incur when they are assigned each reserve service.
- PJM has put together this presentation to be responsive to questions received from stakeholders.
- The material presented here does not represent a change to PJM's proposed market design or package; it is simply a reframing of previously presented material in the hopes of aiding understanding and providing additional clarity.



Reserve Product to Reserve Service Mapping

Reserve Service	Provided by Reserve Products
Synchronized Reserves	<ul style="list-style-type: none">• Synchronized Reserve Product
10-Min Ramp/Uncertainty Reserves Up	<ul style="list-style-type: none">• 10-Min Ramp/Uncertainty Reserve Up Product
10-Min Ramp/Uncertainty Reserves Down	<ul style="list-style-type: none">• 10-Min Ramp/Uncertainty Reserve Down Product
30-Min Ramp/Uncertainty Reserves	<ul style="list-style-type: none">• 30-Min Ramp/Uncertainty Reserve Product
30-Min Reserves	<ul style="list-style-type: none">• 30-Min Ramp/Uncertainty Reserve Product• 30-Min Secondary Reserve Product
Day-Ahead Scheduling Reserves	<ul style="list-style-type: none">• 10-Min Ramp/Uncertainty Reserve Up Product• 30-Min Ramp/Uncertainty Reserve Product• 30-Min Secondary Reserve Product• 60-Min Non-Spin Reserve Product• 60-Min Spin Reserve Product
Energy Gap Reserves	<ul style="list-style-type: none">• 10-Min Ramp/Uncertainty Reserve Up Product• 30-Min Ramp/Uncertainty Reserve Product• 60-Min Spin Reserve Product

Consequences for non-performance in settlements are based on reserve **product** assignment.

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide reserves at the levels it was cleared day-ahead.
- A resource will have met this obligation if it bids into the real-time energy market such that it can provide the quantity of reserves cleared day-ahead with the same level of flexibility required by the reserve obligation.

Convert reserves to energy when instructed

- To meet its performance obligation, an offline resource must come online when called by PJM and reach its economic minimum within 30 minutes.

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource must pay for any availability shortfall at the greater of 1.25 times the DASR clearing price or the real-time 30-Min Reserve clearing price.

Failure to convert reserves to energy

- A resource must pay for any performance shortfall at the greater of 1.5 times the DASR clearing price or 1.5 times the real-time 30-Min Reserve clearing price.

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide energy and reserves at the levels it was cleared day-ahead.
- A resource will have met this obligation if it bids into the real-time energy market such that it can provide the quantity of energy and reserves cleared day-ahead with the same level of flexibility required by the reserve obligation.

Convert reserves to energy when instructed

- To meet its performance obligation, a resource must follow its dispatch instructions.

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource must pay for any availability shortfall at the greater of 1.25 times the Energy Gap Reserve clearing price or the real-time 30-Min RUR clearing price.

Failure to convert reserves to energy

- Energy deviations

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide energy and reserves at the levels it was cleared day-ahead.

Convert reserves to energy when instructed

- To meet its performance obligation, a resource must come online when called by PJM and reach its economic minimum within 30 minutes.

Note: this is status quo for PJM's offline 30-Min Reserves.

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource that clears for 30-Min Reserves day-ahead but is not available to provide those reserves in real-time will have to buy out of its day-ahead assignment at the real-time 30-Min Reserve market clearing price through the two-market settlement.

Failure to convert reserves to energy

- A resource must pay for any performance shortfall at the greater of 1.5 times the real-time 30-Min Reserve clearing price.

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide energy and reserves at the levels it was cleared day-ahead.
- To maintain availability in real-time, a resource must follow PJM's dispatch instructions, including dispatch down to make reserves available.

Convert reserves to energy when instructed

- To meet its performance obligation, a resource must follow its dispatch instructions.

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource that clears for 30-Min RUR day-ahead but is not available to provide those reserves real-time will have to buy out of its day-ahead assignment at the real-time 30-Min RUR clearing price.
- A resource that clears for 30-Min RUR in real-time but does not follow PJM's dispatch instructions will have to pay for that shortfall at 1.25 times the 30-Min RUR market clearing price.

Failure to convert reserves to energy

- Energy deviations.

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide energy and reserves at the levels it was cleared day-ahead.
- To maintain availability in real-time, a resource must follow PJM's dispatch instructions, including dispatch down to make reserves available.

Convert reserves to energy when instructed

- To meet its performance obligation, a resource must follow its dispatch instructions.

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource that clears for 10-Min RUR day-ahead but is not available to provide those reserves real-time will have to buy out of its day-ahead assignment at the real-time 10-Min RUR clearing price.
- A resource that clears for 10-Min RUR in real-time but does not follow PJM's dispatch instructions will have to pay for that shortfall at 1.25 times the 10-Min RUR market clearing price.

Failure to convert reserves to energy

- Energy deviations.

What must a resource do when it gets a reserve assignment?

Maintain reserve availability

- To meet its availability obligation, a resource should take any actions necessary to be available in real-time to provide energy and reserves at the levels it was cleared day-ahead.
- To maintain availability in real-time, a resource must follow PJM's dispatch instructions, including dispatch down to make reserves available.

Convert reserves to energy when instructed

- To meet its performance obligation, a resource must convert its assigned SR into energy during a Synchronized Reserve Event.
- Assigned SR must be fully converted into energy within 10 minutes.

Note: this is status quo

What are the consequences if a resource fails to meet its reserve obligations?

Failure to maintain reserve availability

- A resource that clears for SR day-ahead but is not available to provide those reserves real-time will have to buy out of its day-ahead assignment at the real-time SR clearing price.
- A resource that clears for SR in real-time but does not follow PJM's dispatch instructions will have to pay for that shortfall at 1.25 times the SR market clearing price.

Failure to convert reserves to energy

- Resources must pay for any shortfall at the greater of the average cost of SR procurement from the prior year or the highest RTO real-time energy price in the 6 intervals following the Synchronized Reserve Event.

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Acronym	Term & Definition
SR	Synchronized Reserves are reserves provided by resources that are synchronized to the grid and can respond within 10 minutes.
RUR	Ramping/Uncertainty Reserves are reserves that would be procured to manage forecasted ramp and uncertainty operational flexibility needs.
MW	A Megawatt is a unit of power equaling one million watts (1 MW = 1,000,000 watts) or one thousand kilowatts (1 MW = 1,000 KW).

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