

101 DISPATCHING THE ENERGY MARKET MERIT ORDER

1. Purpose

To define the methodology used by the System Controller (SC) when dispatching bids and offers in the energy market merit order under normal operating conditions.

2. Background

The energy market merit order is the list of all valid offers and bids for energy assets submitted by pool participants, sorted in order of offer and bid price blocks. The energy assets are dispatched to maintain a balance between energy supply and demand.

Also included in this OPP are procedures for dispatching the dispatch down service (DDS) merit order. The DDS merit order is a list of assets that may be dispatched in accordance with the Market Participation Rules (Part Two of the ISO Rules) to offset the effect on pool price caused by TMR dispatches.

3. Policy

- The energy market merit order is sorted by descending order of price (\$/MW).
- Bids priced above the current system marginal price (SMP) are fully dispatched on.
- Bids priced equal to the current SMP are either dispatched off or dispatched on for partial block volumes.
- Bids priced below the current SMP are dispatched off.
- Offers priced above the current SMP are dispatched off.
- Offers priced equal to the current SMP are dispatched on for either their full or partial volumes.
- Offers priced below the current SMP are fully dispatched on.
- In dispatching a block of energy in the energy market merit order, consideration will be given to the constraints of the asset submitted in the bid or offer, except:
 - If an energy block is already dispatched on for partial block volume, it will be dispatched on for the full block volume, regardless of its asset constraints, before another higher priced energy block is dispatched.
 - If an asset's first non-zero block is in merit, an energy market dispatch will be issued to it, regardless of whether the minimum on/off time or start up/shutdown time constraint has been met.
- Dispatch volumes will be determined on a pro rata basis when dispatching multiple equally-priced bids and/or offers, except for imports and exports which will follow procedures as

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described in [OPP 301](#) and [OPP 302](#) and dispatching equally priced \$0 offers as described in OPP 103. In the event that one or more of the equal-priced blocks is inflexible, efforts will be made to accommodate the inflexible block(s) and to minimize dispatching higher blocks in the energy merit order.

- Assets in the DDS merit order will be dispatched in accordance with the Market Participation Rules.
- If generation is constrained down by a directive from the SC when energy is required to be dispatched off for DDS, then the greater of the following amounts will be dispatched to provide DDS:
 - an amount equivalent to the volume of out of merit energy dispatched on for TMR (MW) less the constrained down directive quantity (MW).
 - 0 MW.

4. Responsibilities

4.1 ISO

The ISO is responsible for:

- Reviewing and updating this OPP as required.

System Controller

The SC is responsible for:

- In accordance with this OPP, dispatching the energy market merit order and DDS merit order.

4.2 Participants

- Pool participants will comply with the Market Participation Rules as it applies the subject matter of this OPP.
- A pool participant with a generating asset that has a start up time greater than 1 hour must enter a start time in the automated dispatch and messaging system (ADAMS) in order for it to appear in the energy market merit order and be eligible for dispatch. The start time entered in ADAMS must allow for the complete period of the generating asset start up time (i.e., start time – time of ADAMS submission \geq generating asset start up time) and be submitted at least 2 hours before the start of the settlement interval.
- In accordance with the previous point, generating assets that have been dispatched for TMR must also enter a start time in ADAMS if their start up time is greater than 1 hour.

5. System Controller Procedures

5.1 Advance energy market dispatch for imports and exports

The SC will:

1. Verify that all imports are priced at \$0.00 and all exports are priced at \$999.99. If an import block price is higher than \$0.00 or an export block price is lower than \$999.99, notify the pool participant and only dispatch the block when the price is corrected.

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2. Issue an advance energy dispatch to the import and export blocks at least 25 minutes before the next scheduling hour. The dispatch time will be the start of the next scheduling hour.

5.2 Energy market dispatch

The SC will:

1. For changes in supply and/or demand, make energy dispatches from the energy market merit order to the next non-zero block of energy.
2. If system demand is increasing or supply is decreasing, dispatch the next higher non-zero block in the energy market merit order (see Section 5.3).
3. If system demand is decreasing or supply is increasing, dispatch the next lower non-zero block in the energy market merit order (see [Section 5.4](#)).

5.3 Dispatching the next higher non-zero block of energy

The SC will:

1. If the next higher operating block available is an offer that is a flexible block:
 - a. And the block size is greater than or equal to the increase in demand, dispatch on the partial or entire block, which will set the SMP.
 - b. And the block size is less than the increase in demand, dispatch on the block and consider the next higher block in the energy market merit order for dispatch.
2. If the next higher operating block available is an offer that is an inflexible block:
 - a. And the block size is greater than the increase in demand, skip over this block. Consider the next higher block in the energy market merit order for dispatch. When the total volume of the inflexible block can be accommodated, dispatch off the higher block and dispatch the inflexible block.
 - b. And the block size is equal to the increase in demand, dispatch on the block, which will set the SMP.
 - c. And the block size is less than the increase in demand, dispatch on the block, and consider the next higher block in the energy market merit order for dispatch.
3. If the next higher operating block available is a bid that is a flexible block:
 - a. And the block size is equal to the increase in demand, dispatch off the block, which will set the SMP provided it is not an export block. In the case when it is an export block, the SMP will be set by the next lower intra Alberta non-zero energy block.
 - b. And the block size is greater than the increase in demand, dispatch on the block for partial block volume, which will set the SMP provided it is not an export block. If it is an export block, the SMP will be set by the next lower intra Alberta non-zero energy block.
 - c. And the block size is less than the increase in demand, dispatch off the block, and consider the next higher block in the energy market merit order for dispatch.
4. If the next higher operating block available is a bid that is an inflexible block:

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- a. And the block size is greater than the increase in demand, dispatch off the block until the full block can be served. Consider the next lower block in the energy market merit order for dispatch in order to maintain supply and demand balance.
 - b. And the block size is equal to the increase in demand, dispatch off the block, which will set the SMP provided it is not an export block. If it is an export block, the SMP will be set by the next lower intra Alberta non-zero energy block.
 - c. And the block size is less than the increase in demand, dispatch off the block, and consider the next higher block in the energy market merit order for dispatch.
5. If the next higher block is the reference price block:
- a. And the amount of energy dispatched off for DDS is greater than or equal to the increase in demand, then dispatch on a partial amount or all of the energy that was dispatched off for DDS from the highest to the lowest cost service, the next lower non-zero block of energy to the reference price will set the SMP.
 - b. And the amount of energy dispatched off for DDS is less than the increase in demand, then dispatch on the energy that was dispatched off for DDS and consider the next higher block in the energy market merit order for dispatch.
 - c. And no assets were dispatched to provide DDS, then consider the next higher block in the energy market merit order for dispatch.

5.4 Dispatching the next lower non-zero block of energy

The SC will:

1. If the next lower operating block available is an offer that is a flexible block:
 - a. And the block size is greater than the decrease in demand, dispatch on the block for its partial volume, which will set the SMP.
 - b. And the block size is equal to the decrease in demand, dispatch off the block. The next lower non-zero offer block in the energy market merit order will set the SMP.
 - c. And the block size is less than the decrease in demand, dispatch off the block, and consider the next lower block in the energy market merit order for dispatch.
2. If the next lower operating block available is an offer that is an inflexible block:
 - a. And the block size is greater than the decrease in demand, dispatch off the block. Consider the next higher block in the energy market merit order for dispatch in order to maintain supply and demand balance.
 - b. And the block size is equal to the decrease in demand, dispatch off the block. The next lower non-zero offer block in the energy market merit order will set the SMP.
 - c. And the block size is less than the decrease in demand, dispatch off the block, and consider the next lower block in the energy market merit order for dispatch.
3. If the next lower operating block available is a bid that is a flexible block:
 - a. And the block size is greater than the decrease in demand, dispatch on the block for its partial volume, which will set the SMP provided it is not an export block. If it is an export block, the SMP will be set by the next lower intra Alberta non-zero energy block.

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- b. And the block size is equal to the decrease in demand, dispatch on the block. The next lower non-zero offer block in the energy market merit order will set the SMP.
- c. And the block size is less than the decrease in demand, dispatch on the block, and consider the next lower block in the energy market merit order for dispatch.
4. If the next lower operating block available is a bid that is an inflexible block:
 - a. And the block size is greater than the decrease in demand, do not dispatch the block on until the block can be fully dispatched. Consider the next lower block in the energy market merit order for dispatch.
 - b. And the block size is equal to the decrease in demand, dispatch on the block. The next lower non-zero offer block in the energy market merit order will set the SMP.
 - c. And the block size is less than the decrease in demand, dispatch on the block, and consider the next lower block in the energy market merit order for dispatch.
5. If the next lower block is the reference price block:
 - a. And TMR is dispatched on then determine if an asset is eligible to be dispatched to provide DDS according to the following criteria:
 - Assets that are in an area where generation is constrained down by a directive from the SC are not eligible to be dispatched to provide DDS.
 - If the dispatch of an asset to provide DDS will cause TMR to be required, then the asset is not eligible to be dispatched to provide DDS.
 - b. If the criteria in step a is met, then determine the volume of energy required to provide DDS, in accordance with the following:
 - If generation is not constrained down by an SC directive, then:
Volume of energy required to provide DDS (MW) = Volume of out of merit energy dispatched on for TMR (MW); if there is less DDS offered than TMR, then only dispatch the total amount of DDS available.
 - If generation is constrained down by an SC directive, then:
Volume of energy required to provide DDS (MW) = Volume of out of merit energy dispatched on for TMR (MW) – Constrained down directive volume (MW)
 - c. If the criteria in step a are met, and the volume of energy required to provide DDS as determined in step b is greater than or equal to the decrease in demand, then dispatch an amount of assets to provide DDS equal to the decrease in demand. The next lower non-zero block of energy to the reference price block will set the SMP
 - d. If the criteria in step a are met, and the volume of energy required to provide DDS as determined in step b is less than the decrease in demand, then dispatch an amount of assets to provide DDS equal to the volume determined in step b and consider the next lower block in the energy market merit order for dispatch.
 - e. And no assets were dispatched for TMR, then consider the next lower block in the energy market merit order for dispatch.

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5.5 Dispatching the DDS Merit Order when TMR is dispatched on

When out of merit energy is dispatched on for TMR, the SC will:

1. Determine the eligibility of assets to provide DDS according to the following:
 - If SMP is greater than the reference price then assets cannot be dispatched to provide DDS.
 - Assets that are in an area where generation is constrained down by a directive from the SC are not eligible to be dispatched to provide DDS.
 - If the dispatch of an asset to provide DDS will cause TMR to be required, then the asset is not eligible to be dispatched to provide DDS.
2. If the criteria in step 1 is met, then determine the volume of energy to dispatch to provide DDS in accordance with the following:
 - If generation is not constrained down by SC directive, then:
$$\text{DDS volume (MW)} = \text{Volume of out of merit energy dispatched on for TMR (MW)}$$
 - If generation is constrained down by SC directive, then:
$$\text{DDS volume (MW)} = \text{Volume of out of merit energy dispatched on for TMR (MW)} - \text{Constrained down directive volume (MW)}$$
3. Dispatch the volume of energy to provide DDS from assets in the DDS merit order that satisfies the requirements in steps 1 and 2, starting with the lowest cost service and going up the DDS merit order. If the next asset in the DDS merit order to be dispatched is in an area where generation is constrained down or will cause additional TMR to be dispatched, then skip this asset in the DDS merit order and consider dispatching the next higher eligible asset to provide DDS as required.
4. If all the energy eligible to be dispatched to provide DDS (in accordance with step 1) is less than the volume of DDS required (in accordance with step 2), then dispatch all the eligible energy from assets in the DDS merit order to provide DDS and continue to dispatch TMR as required.

5.6 Dispatching the DDS merit order when TMR is dispatched off

When out of merit TMR energy is dispatched off and SMP is less than the reference price, then the SC will:

1. Determine the volume of energy to release from providing DDS in accordance with the following calculation:
$$\text{Volume of energy to release from providing DDS (MW)} = \text{Volume of energy providing DDS (MW)} + \text{Volume of generation constrained down by SC directive (MW)} - \text{Remaining volume of out of merit energy dispatched on for TMR (MW)}$$
2. Release assets from providing DDS in accordance with the volume determined in step 1 (if value is negative use 0 MW) starting with the highest cost service and going down the DDS merit order.

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5.7 Dispatching an equally priced offer and reference price block

If an offer is priced equally with the reference price block, then the SC will:

1. If dispatching up the energy market merit order, dispatch on the offer before releasing assets from providing DDS.
2. If dispatching down the energy market merit order, dispatch assets to provide DDS before dispatching off the offer.

5.8 Dispatching an equally priced bid and reference price block

If a bid is priced equally with the reference price block, then the SC will:

1. If dispatching up the energy market merit order, dispatch off the bid before releasing assets from providing DDS.
2. If dispatching down the energy market merit order, dispatch assets to provide DDS as required before dispatching on the bid.

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6. Revisions and Approval

6.1 OPP

Issued	Description
	Supersedes 2004-08-04
2004-08-04	Supersedes 2003-07-28
2003-07-28	Revised to ISO Operating Policies and Procedures

6.2 Antecedent POP and OP

POP 102		No OP counterpart	
Issued	Description	Issued	Description
2002-03-01	Supersedes 2001-04-09		
2001-04-09	Supersedes 2000-12-04		
2000-12-14	New issue, replacing POB 001		

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