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Information Document
Dispatches
ID #2012-005R

Information documents are not authoritative. Information documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an information document and any authoritative document[1] in effect, the authoritative document governs.

1   Purpose

This information document relates to the following authoritative documents:

- Section 201.7 of the ISO rules, *Dispatches* ("Section 201.7");
- Section 203.2 of the ISO rules, *Issuing Dispatches for Energy* ("Section 203.2");
- Section 203.4 of the ISO rules, *Delivery Requirements for Energy* ("Section 203.4");
- Section 203.5 of the ISO rules, *Consumption Requirements for Bids (*"Section 203.5");
- Section 204.2 of the ISO rules, *Issuing Dispatches for Dispatch Down Service* ("Section 204.2"); and
- Section 205.8 of the ISO rules, *Transmission Must Run* ("Section 205.8").

The purpose of this information document is to provide guidance regarding the content of dispatches for energy, dispatch down service and transmission must-run that are issued by the AESO, and the process for a pool participant to acknowledge receipt of a dispatch. This information document is likely of most interest to pool participants who receive these dispatches.

2   Dispatch Content

In accordance with subsection 3 of Section 201.7, pool participants are required to comply with dispatches that they receive from the AESO for energy, dispatch down service and transmission must-run.

Dispatches in the Automated Dispatch and Messaging System ("ADaMS") include the information set out below (see Appendix 1):

(a) name of the pool asset;

(b) the instruction for the pool asset:

   (i) for source assets:

      (A) Dispatch On (deliver energy or dispatch down service); or

      (B) Dispatch Off (reduce energy or dispatch down service or dispatch down service delivery)

   (ii) for sink assets:

      (A) Dispatch On (consume additional energy); or

      (B) Dispatch Off (reduce consumption)

   (iii) for transmission must-run, the service to be provided;

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[1] "Authoritative document" is the general name given by the AESO to categories of documents made by the AESO under the authority of the *Electric Utilities Act* and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. Authoritative documents include: the ISO rules, the reliability standards, and the ISO tariff.

(c) specific MW value to which the pool asset is receiving a dispatch; and

(d) date and time the dispatch is to take effect.

Note that, for energy dispatches the date and time the dispatch is to take effect is indicated in the "Dispatch Effective" header of the ADaMS Dispatch Pane and is referred to in subsection 4 of Section 203.4 as "the time specified in the dispatch." (see Appendix 1).

For more information regarding dispatches in ADaMS, please see the *Automated Dispatch and Messaging System Participant Manual* in the help section of ADaMS, which is available to registered users only.

3   Acknowledging Dispatches

Subsection 5 of Section 201.7 requires pool participants to acknowledge receipt of a dispatch. In the case of an automated message, pool participants may acknowledge receipt of the dispatch by selecting the "Ack Disp" radio button within the ADaMS dispatch pane (see Appendix 1).

4   Declaration of Transmission Must-Run Capability

Under subsection 2(2) of Section 205.8, a pool participant under contract for transmission must-run ("TMR") is required to submit a declaration of TMR capability via the Energy Trading System ("ETS") before 12:00 hours on the day before the day that the offer is effective. The AESO recognizes that the current version of ETS may inhibit pool participants from submitting a TMR declaration in accordance with subsection 2(2) of Section 205.8 and is considering alternatives to resolve this issue. In the interim, pool participants under contract for TMR are asked to submit TMR declarations to the AESO when the information becomes available.

5   Dispatch Compliance when Ramping to Minimum Stable Generation

Subsection 6, "Exceptions to Non-Compliance" of Section 203.4 outlines the exceptions to non-compliance with a dispatch for a source asset. The available capability of a source asset must reflect the full physical capability of the source asset.

Subsection 6(1)(c)(i) only applies when a pool participant is synchronizing a source asset to the grid. Once the source asset has been synchronized to the grid, subsection 6(1)(c)(i) no longer applies.

The compliance exception outlined in subsection 6(1)(c)(iii) applies when a source asset has synchronized and is ramping up to its minimum stable generation. In this case, a dispatch to minimum stable generation is not required and the verbal plan communicated to the ISO must be updated for deviations of greater than 30 minutes or 50 MW.

6   Energy Storage

A pool participant with a standalone energy storage resource, or an aggregated facility made up of energy storage resources will be assigned a single source asset and will be required to offer into the energy market if the discharge capability is 5 MW or greater. The AESO will classify these assets as "controllable" and any dispatched offer blocks will have the same dispatch compliance requirements as other controllable assets, such as generating units.

A pool participant with a renewable site co-located with energy storage may choose to offer all generating facilities on site as a single source asset, or as separate source assets for each technology; however, this choice is limited by the metering configuration. Both participation methods are subject to the dispatch requirements described in Section 203.4. If a pool participant chooses to offer as a single source asset, the configuration of the source asset will be classified as a partially controllable source asset and is

subject to the dispatch tolerance requirements in Section 203.4 with the corresponding applicability of the allowable dispatch variance applicable to a partially controllable source asset as defined in the AESO's *Consolidated Authoritative Document Glossary*. Should the aggregated facility include wind or solar resources, the aggregated facility would also be subject to the requirements of Section 304.3 *Wind Power Ramp Up Management* and Section 304.9 *Wind and Solar Aggregated Generating Facility Forecasting*. The determination on the asset classification is made between the AESO and market participants during the connection process.VER block is the AESO's mechanism for assessing the dispatch compliance of Wind or Solar and Storage hybrid source assets within the Energy Market.

Section 201.7, *Dispatches* places a requirement on Pool Participants to comply to ISO dispatch instructions and directives, and more specifically in Section 203.4, *Delivery Requirements for Energy* for source asset dispatches. Section 203.4 specifies the instruction should be maintained within an allowable dispatch variance (ADV). ADV is defined within the Consolidated Authoritative Document Glossary (CADG). The dispatch variance varies based on the nature of the underlying asset technology.

There are 3 considerations for energy storage, 1) dispatch compliance for co-located technologies offering as independent assets, 2) dispatch compliance for hybrids able to deliver their full capability to the Alberta Interconnected Electric System ("AIES"), or 3) dispatch compliance for connection limited hybrids. Each configuration is described in further detail below:

1) Dispatch Compliance for co-located technologies offering as independent assets

This configuration is where the Pool Participant has chosen to separate the operation of the co-located technologies. In doing so, each asset will have its own dispatch compliance requirements based on the underlying technology.

Aggregated facilities made up entirely of wind turbines or solar panels are required to deliver up to the lesser of the block MW dispatched or the wind or solar potential MW. The tolerances around the expected level vary based on the size of the asset. A stand-alone energy storage resource is treated like stand-alone generating units and must meet the ramping requirements specified in Section 203.4 and have its output within plus or minus five (5) MW for a generating source asset with a maximum capability of two hundred (200) MW or less; or plus or minus ten (10) MW for a generating source asset with a maximum capability of greater than two hundred (200) MW.

2) Dispatch Compliance for Hybrids able to deliver their full capability

The dispatch tolerance definition now considers hybrid aggregated facilities made up of a combination of variable energy resources (VERs) and storage offering into the market as a single asset.

The AESO will compartmentalize the offer into two parts. The bottom part of the offer (starting from block zero) will represent the variable energy component of the technology and it will follow the same dispatch compliance requirements as aggregated facilities made up entirely of wind turbines or solar panels as in configuration 1, up to the size of the capability of the VER. The remainder of the offer will represent the energy storage component of the asset and will have similar dispatch compliance requirements as generating units. The size of the capability of the VER is submitted and restated by the market participant, and is known as the VERblock (VERb)

Expected output from a hybrid asset is based on the following formula:

(a) when the dispatch level is greater than the VERb specified by the pool participant, the expected output is equal to the dispatch level minus VERb plus Potential MW

(b) when the dispatch level is greater than the VERb specified by the pool participant the expected output is equal to the potential MW

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For example, a 400 MW hybrid asset made up of 200 MW of solar and 200 MW of energy storage for a combined maximum capability of 400 MW with an offer shown in figure 1 below. The solar potential is currently 70 MW and the energy price is $50/MWh. As such, the asset is dispatched to block 0, 200 MW. But since the VER capability of the asset is 200 MW the AESO will treat the asset like wind and solar and require the asset to deliver 70 MW because of the current solar potential. If the price jumps to $64/MWh the asset will be required to deliver all of its solar potential plus the 20 MW of energy from the storage component of the asset. If the price increases to $70/MWh the asset will be required to deliver 70 MW [2] plus 20 from block 1 and 30 MW from block 2 for a total of 90 MW.

Block	$/MWh	MW	bk sz	NTG (MW)
bk 4	225	400	60	270
bk 3	224	340	90	210
bk 2	65	250	30	120
bk 1	64	220	20	90
bk 0	0	200	200	70

Figure 1 - Discharging in all blocks

Using the same example asset, if the asset operator wishes to charge its storage with its onsite solar, the offer must be structured such that some or all of the potential MW are out of merit, as is shown in Figures 2a, b and c below. By setting block zero to 0 MW means the site will not export any energy to the AIES until the price reaches $64/MWh. If the price reaches $70/MWh the asset will be required to deliver all of its solar potential plus the 20 MW from block 1 and the 30 MW from block 2.

Block	$/MWh	MW	bk sz
bk 4	225	400	60
bk 3	224	340	90
bk 2	65	250	30
bk 1	64	220	220
bk 0	0	0	0

Figure 2a – Charging in block zero

[2] The allowable dispatch variance is excluded from these examples to simplify the concept. The actual delivery requirements would include a range of + or - 10 MW from the expected net to grid (NTG) MW volume.
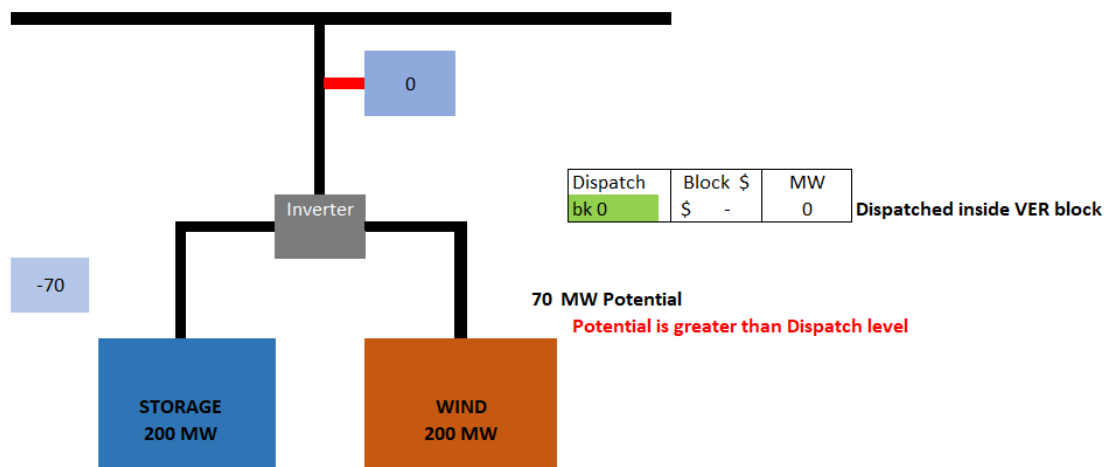
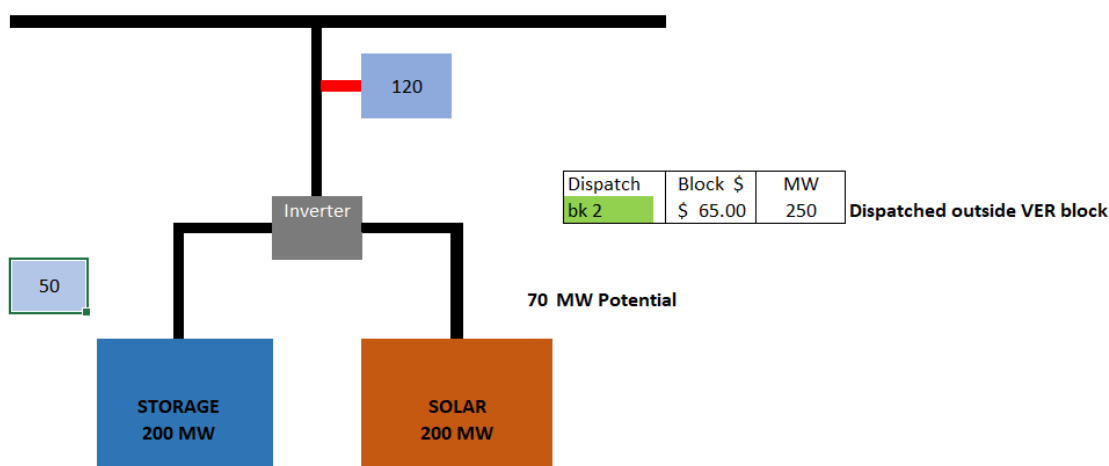**Figure 2b – Dispatched to block 0 and charging storage**

Figure 2c – Dispatched to block 2 and exporting to AIES

3) Dispatch Compliance for Connection Limited Hybrids

There are situations where the capability of the supply resources behind the fence are greater than the export capability of the connection to the AIES. An example of how this could be an existing wind or solar facility develops energy storage without increasing the capability of the transformer.

For connection limited hybrids, the energy storage will be deemed "controllable" and required to firm the VER up to the MW capability of the energy storage with the VER block set to zero.

For example, a hybrid asset made up of 380 MW of solar and 50 MW of storage could have an asset maximum capability of 400 MW due to a transformer limitation. As a result, 30 MW of capability is unable to reach the AIES. If the operator submitted the same offer as the hybrid example above (shown again in figure 3) with a solar potential of 70 MW, the offer would have an expected output of 120 MW at any of

the submitted block prices. Regardless of the pool price, the expected energy delivery will be the solar potential of 70 MW plus the full capability of the storage at 50MW, totaling 120 MW.

Block	$/MWh	MW	bk sz	Expected NTG (MW)
bk 4	225	400	60	120
bk 3	224	340	90	120
bk 2	65	250	30	120
bk 1	64	220	20	120
bk 0	0	200	200	120

Figure 3 – Discharging in all blocks

Participants with connection-limited hybrid assets will need to structure their offer appropriately if the participant chooses to charge the storage using the onsite solar. To charge the storage, the participant must submit an offer that puts a portion of the real-time potential out of merit, as shown in Figure 4.

Block	$/MWh	MW	bk sz	Expected NTG (MW)
bk 4	225	400	0	120
bk 3	224	400	0	120
bk 2	65	400	0	120
bk 1	64	400	350	120
bk 0	0	50	50	50

Figure 4 – Charging Connection Limited Hybrids

Using the same configuration as the previous example, a 400 MW connection-limited hybrid asset made up of a 50 MW storage resource added to an existing 380 MW solar farm would have to offer in a similar manner to figure 4, if desiring to charge the storage. If the potential is 70 MW and the price is under $64/MWh then the operator would send any potential MW greater than 50 MW to the storage.   As stated above, there is a risk with this configuration that the storage would have to spill energy if the potential exceeds 100 MW or the state of charge of the storage reaches 100%. The participant will have an acceptable operating reason (AOR) to restate the offer if the asset reaches 100% state of charge. A problem with connection-limited hybrid assets is there is limited ability to hold back discharge when the potential is at or near the size of the storage, short of adjusting the allowable dispatch variance.

7   Energy storage ancillary service dispatches and directives

If a pool participant with an energy storage facility:

(a)   participates in the operating reserve markets with the full range of the energy storage facility as the resource; and

(b)   the associated source asset receives a dispatch to reduce its output in the energy market as a result of an operating reserve dispatch,

then when the energy storage resource receives a directive to provide its operating reserves, in the form of energy, it will be expected to adjust its current operating level to the current operating level plus the spinning reserve or supplemental reserve quantity. For example, if an energy storage resource that is at an operating level of consuming 3 MW, and it is issued a dispatch to provide 5 MW of operating reserves; if the AESO issues a directive for the operating reserve capacity, the resource will move from consuming 3 MW to an operating level of producing 2 MW.

8   Bid Dispatches

Market participants have the option to bid their energy consumption, regardless of the technology of their sink asset. The amendments to Section 202.3, Issuing Dispatches for Equal Prices ("Section 202.3") and Section 203.5, Consumption Requirements for Bids ("Section 203.5") clarify the requirements for submitting bids, dispatching equal priced-bid operating blocks, and bid dispatch compliance.

If a pool participant chooses to submit a bid for its sink asset: (i) operating block sizes must be entered into ETS in 1 MW increments (i.e., no fractions); and (ii) the sink asset must meet the Automated Dispatch and Messaging System requirements and respond to dispatches from the AESO System Controller in accordance with the ISO rules.

In accordance with Section 202.3, if there are equally-priced bid and offer blocks in the merit order, the AESO will continue to serve bid demand by dispatching the offers first. The AESO considers that this is a preferred treatment compared to pro-rata dispatch of all equally priced bid and offer blocks. If there are equally priced bid blocks, the AESO must dispatch the bid blocks on a pro-rata basis, consistent with the treatment of equal-priced offer blocks.

When the AESO issues a dispatch "off" to a sink asset (*i.e.*, when the system marginal price is above the bid block price), Section 203.5 requires a reduction in energy consumption in alignment with the dispatch or directive. Section 203.5 also sets out the ramping compliance requirements and exceptions to non-compliance for sink assets that bid into the energy market.

Conversely, the AESO does not require a sink asset to consume more energy when its bid block is dispatched "on" (i.e., when the system marginal price is less than or equal to the bid block price). Rather, the dispatch "on" is an option (permission) to use more energy, indicating that prices are favorable to consume more energy. A dispatch "on" is not measured against a sink asset's allowable dispatch variance and is not subject to compliance obligations.

9   Appendices

Appendix 1: *Figure 1 – ADaMS Dispatch Pane*

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Revision History

Posting Date	Description of Changes
2025-03-12	Addition of Section 5
2024-04-12	Section 5 was amended to provide additional information regarding requirements for energy storage asset configurations. Section 6 and Section 7 are new additions that support the Energy Storage ISO rule amendments.
2020-06-19	Addition of section 5 Administrative amendments
2019-09-24	Amended section 1 to add reference to Section 203.4. Amended section 2 to add dispatch effective description and updated Appendix 1
2017-03-28	Addition of section 4
2016-09-13	Amended section 3 to reflect change to ADaMS dispatch pane for acknowledging receipt of a dispatch. Administrative updates.
2013-01-08	Initial Release

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Appendix 1

Figure 1 – ADaMS Dispatch Pane