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Market Manual 4: Market Operations

Part 4.3: Real-Time Scheduling of the Physical Markets

Issue 50.0

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This procedure provides guidance to *Market Participants* on the Real-time scheduling process in the *IESO-administered physical markets*.

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This *market manual* may contain a summary of a particular *market rule*. Where provided, the summary has been used because of the length of the *market rule* itself. The reader should be aware, however, that where a *market rule* is applicable, the obligation that needs to be met is as stated in the "Market Rules". To the extent of any discrepancy or inconsistency between the provisions of a particular *market rule* and the summary, the provision of the *market rule* shall govern.

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Reference (Paragraph and Section)	Description of Change
Throughout	Repaired broken hyperlinks.
Section 7.1	Updated communication requirements for dispatchable loads when not in their normal energy withdrawal pattern.

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Market Manuals

The *Market Manuals* consolidate the market procedures and associated forms, standards, and policies that define certain elements relating to the operation of the *IESO-administered markets*. Market procedures provide more detailed descriptions of the requirements for various activities than is specified in the "Market Rules". Where there is a discrepancy between the requirements in a document within a *Market Manual* and the *Market Rules*, the *Market Rules* shall prevail. Standards and policies appended to, or referenced in, these procedures provide a supporting framework.

Market Procedures

The "Market Operations Manual" is Series 4 of the *Market Manuals*, where this document forms "Part 4.3: Real-Time Scheduling of the Physical Markets".

A list of the other component parts of the "Market Operations Manual" is provided in "Part 4.0: Market Operations Overview", in Section 2, "About This Manual".

– End of Section –

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1. Introduction

1.1 Purpose

This document provides *market participants* with the information necessary to support the *real-time schedule* for the *physical markets*. The *IESO* determines *dispatch instructions* for each *registered facility*[1] and *boundary entity* as described in this procedure, as the primary means of coordinating the real-time operation of the *physical markets*.

This procedure addresses:

- The release of the real-time schedule to registered market participants that relates to their registered facilities and boundary entities,
- The release of general real-time schedule to all *market participants*,
- The determination and issuance of dispatch instructions for boundary entities, in the form of interchange schedules to control area operators,
- The determination and issuance of dispatch instructions for registered facilities to registered market participants by the *IESO*, and
- The determination and issuance of standby and activation notices for *hourly demand response (HDR)* resources, in the form of standby and activation reports.

1.2 Scope

This *market manual* is intended to provide *market participants* with a summary of the steps and interfaces between *market participants*, the *IESO*, and other parties during the process for determining the *real-time schedule* for the *physical markets*. The procedural workflows and steps described in this document serve as a roadmap for *market participants* and the *IESO*, and reflect the requirements set out in the *market rules* and applicable *IESO* policies and standards.

This procedure only addresses the process for determining the *real-time schedule*. This procedure does not address the pre-dispatch process[2] that provides inputs into the process for determining the *real-time schedule*.

The *IESO* endeavours to ensure that the correct inputs are provided to the *dispatch algorithm*[3] that calculates the *security*-constrained economic *dispatch* (i.e., the *real-time schedule* of *energy* and *operating reserve*). The *IESO* undertakes regular *security* and *adequacy* assessments:

[1] *Facilities* that are registered with the *IESO* as *boundary entities* to import or export electricity are referred to as *boundary entities* in this procedure. The term '*registered facility*' is used to describe those *facilities* within Ontario that have been registered by *market participants* with the *IESO*.

[2] For more information on the pre-dispatch process, see Market Manual 4.2: Submission of Dispatch Data for the Real-Time Energy and Operating Reserve Markets.

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- To identify events that are likely to occur and adjust the inputs to the *Dispatch* Scheduling and Optimization (DSO) tool so that the resultant set of *dispatch instructions* ensure the *security* and *adequacy* of the *IESO-controlled grid*, and
- To identify events that have occurred to which the routine *dispatch* process will be unable to respond in a manner that continues to ensure the *reliability* of the *IESO-controlled grid*. In such situations, the *IESO* may alter the inputs to the DSO and/or intervene in the routine *dispatch* process by manually altering the *dispatch instructions* to ensure *reliability*. In some extreme cases, the *IESO* may have to suspend normal market operations[4].

1.3 Roles and Responsibilities

Responsibility for establishing the *real-time schedule* in the *physical markets* is shared among:

- **Registered Market Participants** having dispatchable generation or load facilities that are responsible for:
  - Accepting or rejecting *dispatch instructions* or *release notifications* issued by the *IESO*,
  - Following accepted *dispatch instructions*, and
  - Notifying the *IESO* as soon as possible of circumstances that will result in its *facility* not following its *dispatch instructions* to an extent that is material (as defined in Market Manual 4.2, Appendix C).
- **Registered Market Participants** having *HDR* resources that are responsible for:
  - Monitoring standby reports to determine if a standby notice is received,
  - Following *dispatch instructions* in the form of activation notices, and
  - Notifying the *IESO* as soon as possible of circumstances that will result in its *facility* not following its *dispatch instructions* to an extent that is material (as defined in Market Manual 4.2, Appendix C).
- **Registered Market Participants** having boundary entities that are responsible for:
  - Revising and re-submitting *dispatch data* for *boundary entities* when quantities scheduled for those transactions by other *control areas* are less than the quantity offered or *bid* into the Ontario market,
  - Creating and submitting e-Tags for their interchange transactions,
  - Viewing their *interchange schedules* published by the *IESO* to the *market participant* Interface or verbally confirming *interchange schedules* for a *boundary entity* with the *IESO* where the *interchange schedule* differs from the published schedule,
  - Revising and resubmitting e-Tags when *interchange schedule* quantities differ from the quantity provided on the e-Tag, and

[3] The *dispatch algorithm* is run through the *Dispatch* Scheduling and Optimization (DSO) tool operated by the *IESO*.

[4] The process of *market suspension* is set out in Market Manual 4.5: Market Suspension and Resumption.

- Cancelling e-Tags submitted for linked[5] wheeling through transactions whose import and/or export component did not get scheduled for the *dispatch hour*.

- ***Control Area operators*** in areas adjacent to the Ontario *control area* who are responsible for confirming or rejecting the feasibility of *interchange schedules* provided by the *IESO*, and
- The ***IESO*** which is responsible for:
  - Releasing *real-time schedule* information, *market schedule* information, *market prices* and related operational information to *registered market participants*,
  - Publishing dispatch instructions for market participants with boundary entities in the form of interchange schedules,
  - Identifying and removing from schedule linked wheeling through *interchange schedules* whose import and/or export component did not get scheduled for the dispatch hour.
  - Issuing and confirming *dispatch instructions* verbally to *market participants* with *boundary entities* where the *interchange schedule* is different from the published schedule,
  - Issuing dispatch instructions to registered facilities that are not boundary entities,
  - Issuing dispatch advisories, on a reasonable efforts basis, to registered facilities that are not boundary entities, as per *Market Rule* Chapter 7, Section 7.1.6 (*MR* Ch. 7 Sec. 7.1.6).
  - Identifying circumstances where emergency actions are required to maintain the *reliability* of the *IESO-controlled grid*,
  - Informing *market participants*, as soon as practicable, whenever a published *market price* is an administrative price.

1.4 Contact Information

Changes to this public *market manual* are managed via the *IESO* Change Management process. Stakeholders are encouraged to participate in the evolution of this *market manual* via this process.

To contact the *IESO*, you can email *IESO* Customer Relations at customer.relations@ieso.ca or use telephone or mail. Telephone numbers and the mailing address can be found on the IESO website (http://www.ieso.ca/corporate-ieso/contact). Customer Relations staff will respond as soon as possible.

– End of Section –

[5] Linked wheeling transactions are described in Market Manual 4.2, Section 2.5.4.

2. Participant Workstation and Dispatch Workstation

Market participants are required to operate a *participant workstation* and a *dispatch workstation* for the purposes of supporting the process of determining the *real-time schedule*. The *participant workstation* is connected to the Participant Network. *Market participants* submit *bids* and *offers* to the *IESO* via the *participant workstation*, as described in Market Manual 4.2. Valid *bids* and *offers* are then passed to the *IESO's* Market Interface System (MIS) for the purposes of determining the *real-time schedule*. *Dispatch instructions* for *boundary entities*, in the form of the *interchange schedule*, are published via the *Market Participant* Interface, a component of the *participant workstation*.

The *dispatch workstation* is connected to the Real-Time Network, which supports real-time operation of the power system. *Dispatch instructions* for *registered facilities* are submitted to *market participants* via their *dispatch workstation*.

For more information on the system and software requirements for the *participant workstation* and the *dispatch workstation*, refer to Market Manual 6: Participant Technical Reference Manual.

– End of Section –

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3. Determining Real-Time Schedules

The *IESO* uses a range of information to determine the *real-time schedules*, including:

- Dispatch data submitted by registered market participants,
- The registered *generation facility's* maximum ramp rate from the IESO Registration Solution,
- The registered *generation facility's* minimum loading point from the IESO Registration Solution (*MR* Ch. 7 Sec. 2.2.6A), and
- The following registered *generation facility's* characteristics from the IESO Registration Solution (*MR* Ch. 7 Sec. 2.2.6A),
    - Forbidden region data, and
    - Period of steady operation data.
- A default value of zero for the minimum loading point, forbidden region and period of steady operation if none has been registered with the *IESO* with respect to this information.
- Predictions of load for the next sixty-minutes, calculated automatically[6] every five-minutes,
- Generator and transmitter outage information provided by market participants,
- Transfer limits for interconnected interties,
- Total *operating reserve* requirements (10-minute spinning, 10-minute non-spinning, 30-minute) determined by the *IESO*,
- *Local area* reserve requirements (if any), determined by the *IESO*,
- Operating *security* and thermal limits on transmission *facilities*,
- Scheduled interchange for the hour, calculated by the last pre-dispatch run of the DSO[7],
- The output level of each *generator* and the withdrawal levels of each *dispatchable load* and *HDR* resource at the beginning of the *dispatch interval* are set at the *IESO's* best estimate of their actual values, as determined from real-time system data and the *real-time schedule* for the preceding *dispatch interval*,
- *Variable generation* five-minute supply forecast, and
- Such other available information as the *IESO* determines appropriate.

The *IESO* uses this information and the *dispatch algorithm*[8] to determine a *security*-constrained economic *dispatch* schedule for each five-minute *dispatch interval and* to determine anticipated

[6] At the discretion of the *IESO,* we may manually adjust the Ontario *demand* forecast to account for limitations of our automated load predictor to accurately forecast expected load profiles.

[7] The DSO is run with a one-hour time-step in pre-dispatch mode for all the remaining hours of today and, from 16:00 EST on, for all the hours of tomorrow. *Interchange scheduled* by the DSO for the next hour is confirmed with adjacent *control areas* and ramped at or near the top of the hour. Scheduled interchange for the hour is provided as an input to the real-time DSO to calculate the five-minute *dispatch instructions* for internal Ontario resources.

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schedules for a number of advisory intervals within the study period. Daily *energy* limits are not taken into account in determining *real-time schedules*.

The real-time constrained *dispatch* schedule, only, utilizes a two-step optimization technique to determine a *security*-constrained economic *dispatch* schedule for a number of critical intervals over a forward-looking study period. For each real-time constrained *dispatch* schedule, critical intervals are selected by the *IESO* from the study period based on selection criteria defined in the Multi-Interval Optimization Functional Requirements document.

The first critical interval is always the *dispatch interval*, and the remaining critical intervals are advisory intervals. Both the length of the study period and the number of advisory intervals are configurable and may be changed by the *IESO* in the event of significant improvement or degradation of either computer software and hardware performance or the accuracy of predicted demand values (*MR* Ch.7, App. 7.5, Sec. 2.11.3*).*

In the event of a malfunction of the multi-interval optimization algorithm the *IESO* may switch to single interval optimization. During such periods new *dispatch* advisory reports will not be issued. The *IESO* will issue a system message to notify *market participants* whenever single interval optimization is being used.

There are currently five critical intervals selected within a study period of 55 minutes (or 11 intervals).

It should be noted that the *dispatch* advisory reports issued to registered dispatchable *market participants* only include the schedules for the advisory intervals and not for the *dispatch interval*.

The *IESO* will review the output from the *dispatch algorithm* and may manually adjust the *real-time schedule* to reflect control actions that are required to address events that the *IESO* assesses:

- Will have a material impact on the *IESO-controlled grid*, and
- Occur in a timeframe in which the *dispatch algorithm* and market mechanisms cannot respond.

Such events may include:

- Unplanned outages of facilities,
- Rapid changes to *security limits*,
- Unexpected *demand* changes,
- Limitations of the load predictor to accurately forecast Ontario *demand* for the next interval,
- Area reserve inadequacies,
- Voltage problems, or
- Variable generation ramp events.

[8] The real-time DSO uses the *constrained IESO-controlled grid* model.

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To resolve such problems, the *IESO* may intervene in the routine *dispatch* process, where the *IESO* judges that such intervention is viable. In such situations, the *IESO* will manually adjust the *dispatch instructions* that result from the *real-time schedule* generated through the *dispatch algorithm* and issue these adjusted *dispatch instructions*. Where an assessment determines that such intervention is not viable, the *IESO* will suspend normal market operations (see Market Manual 4.5: Market Suspension and Resumption).

– End of Section –

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4. Determining Market Information

Within five minutes following the end of each *dispatch interval*, the *IESO* uses the *dispatch algorithm* to determine the *market schedule* and the *market prices* for that *dispatch interval*. For the purpose of determining the *market schedule* and *market prices* for any *dispatch interval*, the *IESO* uses the same information and data that was used to determine the *real-time schedule* for that *dispatch interval*, except that (*MR* Ch. 7, Sec. 6.4):

- The unconstrained *IESO-controlled grid* model is used,
- The initial conditions used for any *dispatch interval* in the *market schedule* are the final conditions of the *market schedule* for the preceding *dispatch interval*,
- The total *demand* (including losses) to be satisfied within a *dispatch interval* in the *market schedule* are set at the *IESO's* best estimate of its actual value, as determined from real-time system data,
- Total system *energy* losses determined in the *real-time schedule* are represented as an increase in *non-dispatchable load* within the *IESO control area*,
- Any *registered facility* in respect of which a *forced outage* has been detected during a *dispatch interval* are recognized by an adjustment to the input data,
- The estimated deviations between scheduled quantities and actual quantities are represented as a change in *non-dispatchable load* in the *IESO control area*[9],
- The *market schedule* reflects *dispatch* adjustments[10] computed using scheduled injections from the constrained schedule, outlined in *MR* Ch. 7, App 7.5, and
- The *demand* in the *market schedule* will be adjusted when the *IESO* initiates a voltage reduction (3% or 5%) and/or *non-dispatchable* load cuts (rotational, *emergency* or manual load shedding), by an amount expected to offset the impact of the control action (*MR* Ch. 7 Sec. 3.2.1.12).

Note: When the *IESO* undertakes an emergency control action consisting of a voltage reduction and/or *non-dispatchable* load cuts for local or global reasons, the *IESO* will adjust the *demand* in the *market schedule* as soon as practical, considering the nature of the operating conditions at the time, by an amount expected to offset the impact of the control action. The *IESO* will not consider any action resulting in a *demand* reduction of 50 MW or less as a control action for the purposes of this manual.

– End of Section –

[9] Until such time that locational pricing is implemented in the *IESO-administered markets*, in determining the *market schedule* and *market prices* for any *dispatch interval*, the *IESO* shall not have regard to the estimated deviations between scheduled quantities and actual quantities.

[10] These dispatch adjustments will not be considered in determining the *market schedule* and *market prices* for any *dispatch interval* until the date indicated in the previous footnote.

5. Releasing Real-Time and Market Information

5.1 Publication of Real-Time Schedule Information

The *IESO* releases information in support of the *real-time dispatch process*, including *real-time schedules*, *market schedules* and *market prices*. Information relating to specific *registered facilities*, HDR resources, and *boundary entities* is released to the *registered market participant* for that *facility*. Other information relating to the general status of the system is released to all *market participants*.

5.1.1 Registered Facilities (other than boundary entities and HDR resources)

As soon as practical but no later than the start of the *dispatch interval* to which it relates, for each *registered facility* that is a *dispatchable load* or a dispatchable *generator* in respect of which *market participant bid* or *offer* has been submitted for the applicable *dispatch hour*, the *IESO* releases the following information to the *registered market participant* for the *facility:*

- The real-time schedule for that *registered facility*,
- The dispatch advisories for that *registered facility* (*MR* Ch. 7, Sec. 7.1.6), and
- The obligation indicator for any registered *facility* that is a *variable generator*.

The *dispatch* advisory will be issued on a reasonable effort basis and missed *dispatch* advisories will not be re-issued.

Within one hour after each *dispatch hour*, for each *registered facility* that is a *dispatchable load* or a dispatchable *generator* in respect of which a valid *bid* or *offer* has been submitted for the applicable *dispatch hour*, the *IESO* releases the *market schedule*[11] for each *dispatch interval* in the *dispatch hour* to the *registered market participant*.

Additionally, the *IESO* shall *publish* on the *IESO* website:

- The standing *offer* prices and quantities for control action sources of *operating reserve* as determined by the *IESO Board* (*MR* Ch. 5, Sec. 4.5.6A.2), and
- The times and quantities of the voltage reductions and reduction in *thirty-minute operating reserve* when these control action sources of *operating reserve* are scheduled to provide *operating reserve* (*MR* Ch. 5, Sec. 4.5.6A.4).

Also, the *IESO Board* may specify the circumstances under which any one or more of the quantities may either be withdrawn or not introduced, and the manner in which any such withdrawal will be effected and the *publishing* thereof (*MR* Ch.5, Sec. 4.5.6A.3).

[11] This obligation is subject to the provisions of *MR* Ch. 7 Sec. 8.4.

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5.1.2 Hourly Demand Response (HDR) Resources

The *IESO* releases the *pre-dispatch* schedule for each *registered facility* that is an *HDR* resource as soon as practical, but no later than the start of the *dispatch hour* to which it relates[12] (consistent with relevant *reliability standards*).

The *IESO* releases *dispatch instructions,* in the form of an activation notice to the *demand response market participant* (*DRMP)* for each *registered facility* that is an *HDR* resource.

5.1.3 Boundary Entities

As soon as practical and consistent with relevant *reliability standards*, but no later than the start of the *dispatch hour* to which it relates[13], for each *registered facility* that is a *boundary entity* in respect of which the *dispatch instructions* for a given *dispatch hour* provides for the *dispatch* of more than 0 MW, the *IESO* releases the following information to the relevant *market participant*:

- The interchange schedule for that registered facility, as found in the relevant pre-dispatch schedule,
- Any request of that registered facility to submit an offer or bid under a reliability must-run contract and the scheduled use of that registered facility under reliability must-run contracts and contracted ancillary services contracts, and
- The projected market schedule for that registered facility.

5.1.4 All Market Participants

In the five-minute period after the end of each *dispatch interval*, the *IESO* releases to all *market participants* the uniform *market prices* of *energy* and *operating reserves* related to that *dispatch interval*.

Within one hour after the end of the *dispatch hour*, the *IESO* releases to all *market participants* the following information for each *dispatch interval* of that *dispatch hour*:

- Total system load and total system losses,
- Area *operating reserve* requirements,
- For information purposes only, *energy* prices at each set of transmission nodes identified by the *IESO* for this purpose, decomposed as far as practical into an *energy* component, a loss component and a component for all other transmission and system constraints and the prices of each class of *operating reserve* in each reserve area identified by the *IESO* for this purpose,
- Aggregate reliability must-run resources called upon,
- Any area *operating reserve* shortfalls, and
- A list of network and *security* constraints that affected the *real-time schedule*.

[12] Typically, this will be at least 2 hours and 30 minutes prior to the start of the *dispatch hour* due to the scheduling requirements of *HDR* resources.

[13] Typically, this will be at least 30 minutes prior to the start of the *dispatch hour* due to the requirements to provide e-Tags at least 20 minutes prior to the start of the *dispatch hour*.

The *IESO* also releases the *market schedules* for all *dispatch interval*s in the preceding *dispatch hour* to the *registered market participant*, for each *registered facility*.

In the event of a load *curtailment*, the *IESO* will release to all *market participants* an estimate of aggregate load *curtailed* as soon as practicable following the return to a *normal operating state*.

5.2 Publication of Real-Time Dispatch Information

Within one hour after the end of each *dispatch hour*, the *IESO publishes* information regarding the system results and events that occurred during that *dispatch hour*. This information includes:

- Total load met,
- Transmission capacity between the *IESO-controlled grid* and each *intertie zone*,
- Any *outages* of transmission *facilities*,
- Total *operating reserve* scheduled, and total *energy* called from such *operating reserve*, by area,
- The market prices for each dispatch interval, and
- The uniform Hourly Ontario Energy Price (HOEP).

– End of Section –

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6. Determining Dispatch Instructions

6.1 Registered Facilities (other than HDR resources and boundary entities)

The *IESO* will seek to ensure that the *dispatch instructions* issued with respect to each *registered facility*, other than a *boundary entity or HDR* resource, closely approximate the most recent *real-time schedule* for that *registered facility* and *dispatch interval* and are within capabilities of the *facility* as registered with the *IESO*. The *IESO* may, however, issue *dispatch instructions* that depart from the *real-time schedule* produced by the DSO if:

- The *security* and *adequacy* of the system would be endangered by implementing the most recent *real-time schedule*,
- The *dispatch algorithm* has failed, or has produced a *real-time schedule* that is clearly and materially in error,
- The *dispatch algorithm* has produced a *real-time schedule* that does not accurately reflect the *minimum run-time* or lockout[14] status of a *facility* due to *dispatch algorithm* limitations,
- Material changes subsequent to determination of the most recent *real-time schedule*, such as failure of an element of a *transmission system* or failure of a *registered facility* to follow *dispatch instructions*, have occurred, or
- The operation of all or part of the *IESO-administered markets* has been suspended[15] (refer to Market Manual 4.5: Market Suspension and Resumption).

Having produced the *real-time schedule*, an under generation condition may prevail. In such circumstances, the *IESO* will declare an *emergency operating state* if observance of *security limits* under a *normal operating state* will require *curtailment* of *non-dispatchable load*. The *IESO* will implement *demand* management and/or load shedding activities[16], as detailed in the Market Manual 7: Systems Operations Overview[17], to resolve the situation.

[14] The dispatch algorithm does not have the functionality to recognize the operating status of some facilities once they complete dispatch instructions. This is illustrated in, but not limited to, the following examples:

- The dispatch algorithm does not recognize that, once some quick start facilities synchronize, they must remain in service at or above a minimum loading point for a minimum run-time.
- The *dispatch algorithm* does not recognize that, once some *facilities* change their *dispatch* level, they are locked out and cannot change *dispatch* from that level for a specified period of time.

[15] This may occur as a result of one of the preceding bullets.

[16] Implementation of manual load shedding should be preceded by a declaration of an *Emergency Operating State*.

[17] In general, under generation situations should not appear unexpectedly. In most cases, under generation situations should be evident in advance via the Adequacy Report up to 34 days out. These situations may also be identified in an advisory notice – which may include a Maximum Generation Alert, or the outputs of the pre-dispatch run. Control actions to address under generation in these timeframes can include issuance of a System Advisory for under generation, soliciting *offers* for generation and rejecting, revoking, or recalling *outages*.

6.2 Hourly Demand Response (HDR) Resources

The *IESO* will seek to ensure that the *dispatch instructions*¸ in the form of an activation notice, issued with respect to each *registered facility* that is an *HDR* resource for each *dispatch hour* reflect the *pre-dispatch schedule*[18] used for scheduling that *dispatch hour*. The *IESO* may, however, issue *dispatch instructions* that depart from the *pre-dispatch schedule* if:

- The *security* and *adequacy* of the system (internally or externally) would be endangered by implementing the *pre-dispatch schedule,*
- The *dispatch algorithm* has failed, or has produced a *pre-dispatch schedule* that is clearly and materially in error,
- Material changes subsequent to determination of the *pre-dispatch schedule*, such as failure of an element of a *transmission system* or failure of a *registered facility* to follow *dispatch instructions*, have occurred, or
- The operation of all or part of the *IESO-administered markets* has been suspended. Refer to Market Manual 4.5 for more details on this situation.

6.3 Boundary Entities

The *IESO* will seek to ensure that the *dispatch instructions* issued with respect to each *registered facility* that is a *boundary entity* for each *dispatch hour* reflect the *pre-dispatch schedule* used for scheduling that *dispatch hour*. The *IESO* may, however, issue *dispatch instructions* that depart from the *pre-dispatch schedule* if:

- The *security* and *adequacy* of the system (internally or externally) would be endangered by implementing the *pre-dispatch schedule,*
- The *dispatch algorithm* has failed, or has produced a *pre-dispatch schedule* that is clearly and materially in error,
- The *dispatch algorithm* has produced a *real-time schedule* that does not accurately reflect the *minimum run-time* or lockout[19] status of a *facility* due to *dispatch algorithm* limitations,
- Material changes subsequent to determination of the *pre-dispatch schedule*, such as failure of an element of a *transmission system* or failure of a *registered facility* to follow *dispatch instructions*, have occurred,
- In the event of a shortfall in *energy* or *operating reserve*, the output of a *resource* associated with a capacity-backed export is insufficient to support the full export,
- The operation of all or part of the *IESO-administered markets* has been suspended. (Refer to Market Manual 4.5 for more details on this situation.),
- A violation of the net *interchange schedule* limit has occurred,

[18] For *HDR* resources, the pre-dispatch run occurring three hours in advance of the *dispatch hour* will be used for scheduling demand response during the availability window of the *dispatch day*. A resource will be scheduled for four consecutive hours when the *pre-dispatch schedule* is less than the resource's total *bid* quantity.

[19] As defined in section 6.1.

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- Quebec has issued a reliability declaration pursuant to the Amended & Restated IESO-Hydro Quebec Capacity Sharing Agreement, but the *dispatch algorithm* has failed to produce a *pre-dispatch schedule* in accordance with the obligations under the agreement (see Section 6.4), or
- An external jurisdiction has issued a call for capacity, but the *dispatch algorithm* has failed to produce a *pre-dispatch schedule* in accordance with the capacity-backed export obligations (see Section 6.4.5).

In addition, North American Energy Standards Board (NAESB) e-Tags and/or *interchange schedules* for *boundary entities* may be required to be changed following *IESO* confirmation of e-Tags and *interchange schedule* with adjacent *control areas* for (e.g., as a result of a failure to successfully navigate the adjacent market). The sequence of this confirmation is as follows:

- The *IESO* validates e-Tags and confirms the *interchange schedules* with the appropriate *control areas*, prior to five minutes to the start of the *dispatch hour*.

  Note: The *IESO* removes interchange *bids* or *offers* from the schedule where e-Tags are missing, late, invalid, and incorrect and/or *control area* confirmation fails, unless such interchange *bids* or *offers* are required for *reliability* reasons. Refer to Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets, Section 2.5.

- The *IESO* confirms the *interchange schedule(s)* MW quantities with the appropriate *control areas and* quantities are modified prior to the start of the ramp, as necessary, to ensure viable *interchange schedule(s)*. In the event of an *interchange scheduling* disagreement between *control areas*, the lesser quantity shall prevail. Failure to agree to the lesser quantity will result in the *interchange scheduling being reduced to 0 MW*, and
- The *IESO* notifies *market participants* of revised *interchange schedule(s)* MW quantities where quantities have been revised in discussion with other *control areas*.

6.4 Intertie Scheduling Protocols

6.4.1 IESO / NYISO Protocol: NY90

In an effort to ensure fair and efficient use of the *IESO*/NYISO *interties*, the *IESO* and the NYISO have agreed to follow a specific *interchange scheduling* protocol for the exchange of *interchange scheduling* information (*MR* Ch. 7 Sec. 1.4.1). On July 29, 2002, the *IESO* and the New York Independent System Operator (NYISO) adopted a scheduling protocol to effectively coordinate *interchange scheduling* between the two jurisdictions. This *interchange scheduling* protocol establishes a timeline that defines when certain *interchange scheduling* checkout activities occur, both within and between the two organizations. Figure 6-1 illustrates this timeline.

The *IESO* will be marking New York *interchange schedules* with either the "**NY90**", "**MrNh**", "**TLRe**" or "**OTH**" code within the *IESO* systems to reflect schedule check-out activities within the NYISO (see *IESO*-NYISO scheduling protocol below). This approach will result in more accurate and reliable pre-dispatch schedules.

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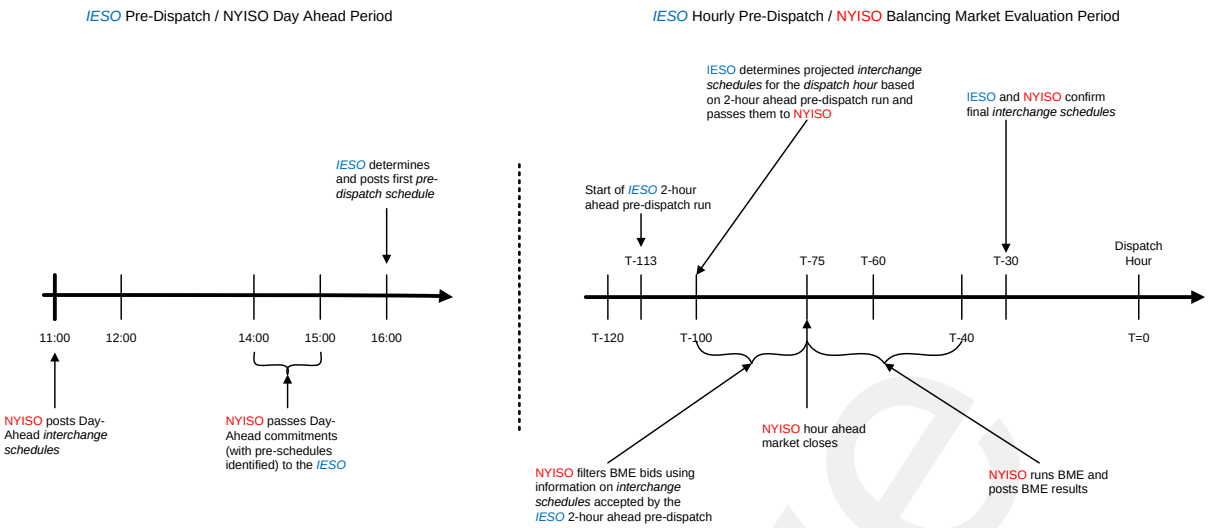


Figure 6-1: IESO - NYISO Scheduling Protocol

Pre-Dispatch Period (*IESO*) and Day-Ahead (NYISO)

11:00 hours (EST) to 12:00 hours	The NYISO posts the Day-Ahead Market schedule
14:00 hours to 15:00 hours	NYISO calls and performs a cursory check on eligible marketers (importers/exporters).
16:00 EST	The *IESO* posts initial *pre-dispatch schedule* for the next 32 hours.

Hourly Pre-Dispatch Period (*IESO*) / RTC (NYISO)

T-100 minutes	The *IESO* determines projected *interchange schedules* for the *dispatch hour* based on the 2-hour ahead pre-dispatch run, applies the **NY90/Max** code to projected *interchange schedules* and communicates the information to the NYISO.
T-100 minutes to T-75 minutes	The NYISO filters the hour ahead Real Time Commitment (RTC) *interchange schedule bids* that affect the *IESO*/NYISO *interties* to include only those *interchange schedules* with *offers*/*bids* accepted by the *IESO's* 2-hour ahead pre-dispatch run.
T-75 minutes to T-40 minutes	The NYISO runs the RTC, automatically adjusting e-Tags accordingly based on the RTC results then notifies the *IESO* of those *interchange schedules* that have failed (in whole or part)[20] to navigate the NYISO market and posts the NYISO Hour-Ahead schedule

[20] The NYISO identifies to the *IESO* those *interchange schedules* not scheduled and partially scheduled by RTC. Those *interchange schedules* scheduled in part by RTC will be scheduled accordingly. Those *interchange schedules* not scheduled will be removed by the *IESO* prior to the *dispatch hour.* In either case the *interchange schedules* will be failed and no CMSC payments will apply.

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Hourly Pre-Dispatch Period (*IESO*) / RTC (NYISO)

T-30 minutes	The *IESO* confirms final *interchange schedules* with the NYISO, making final adjustments to *interchange schedules* accordingly and notifies the *market participant* of the changes by automated e-mail. The NYISO posts RTC results
T-100 minutes to T-75 minutes	Where required for *reliability* reasons, the *IESO* may, in economic merit, include *interchange schedules* from the NYISO 2-hour ahead RTC evaluation that failed the *IESO* 2-hour ahead pre-dispatch run, in the short list for evaluation in the final RTC evaluation, or If necessary, in economic merit, constrain on resources irrespective of the *IESO*-NYISO scheduling protocol.

Revisions and/or additions to *dispatch data* within the two hours prior to the *dispatch hour* are restricted. The *IESO* may accept revisions and/or additions for internal *reliability* reasons. Additionally, at the request of the NYISO, the *IESO* may allow revisions and/or additions during this timeframe if the changes facilitate a solution to NYISO *reliability* concerns. [21]*IESO* / NYISO *interchange schedule* implementation is consistent with the *NERC* transaction ramping default of 10-minutes with the ramp straddling the top of the *dispatch hour*.

6.4.2 Curtailed and Failed Interchange Schedules

An *interchange schedule* that has been curtailed during the *dispatch hour* for *reliability* reasons may be reinstated within that *dispatch hour* if the *reliability* condition causing the curtailment is resolved, and the curtailed *interchange schedule(s)* is scheduled in the next *dispatch hour*.

At T-100 minutes, the projected *interchange schedules* for the *dispatch hour* based on the *IESO's* 2-hour ahead pre-dispatch run are considered as at their maximum available for the *dispatch hour* and are "capped" at that value in the constrained schedule using the code **NY90/Max**[22]. This "short list" is forwarded to NYISO for RTC evaluation. CMSC will apply as per the normal scheduling process, provided the "capped" *interchange schedule(s)* clears the NYISO RTC @ T-75 minutes.

Where required for *reliability* reasons, the *IESO* may, include in the short list for evaluation in the final NYISO RTC evaluation, *interchange schedules* from the NYISO 2-hour ahead RTC evaluation that are the next most economically *interchange schedule(s)*, which failed the *IESO* 2-hour ahead pre-dispatch run. The **NY90/Max** code is **not** used for such *interchange schedules* in the pre-dispatch period when the addition to the short list includes a complete *offer* (either the full quantity of the new *interchange schedule* or an existing *interchange schedule* MW is increased to the full quantity offered). However, CMSC or IOG will be applied as appropriate if the *interchange schedule* is dispatched. The **NY90/Max** code is used if the addition to the short list results in a selection of a partial *interchange schedule offer.*

At-T-30 minutes, *interchange schedules* that failed the NYISO RTC (all or in part) will be failed by the *IESO* using the code **OTH/Fix,** unless failed as a result of external transmission limitation, in which case the **TLRe** code will be applied . No CMSC payments will apply.

[21] This would not include calls for capacity exports

[22] The schedule is re-evaluated in the 1-hour ahead pre-dispatch run, with the market schedule able to increase or decrease, but the constrained schedule only able to decrease.

6.4.3 IESO / MISO Protocol: MISO Protocol

In an effort to facilitate the release of MISO transmission and ramp the IESO has a unique scheduling protocol for all MISO transactions. At T-90, all e-Tags for transactions on the Michigan, Manitoba or Minnesota interfaces will be reduced to their 2 hour out pre-dispatch schedule. Subsequently, all transactions whose schedule increases from 2 hours out to 1 hour out will be re-loaded to reflect their 1 hour out pre-dispatch schedule.

6.4.4 IESO / Hydro-Quebec: Capacity Agreements

The IESO and Hydro-Quebec have capacity agreements. Energy scheduled to satisfy the terms of the agreements will be on the PQ.OUTAOUAIS *boundary entity*. Delivery of firm energy under the agreements is measured as the net schedule on PQ.OUTAOUAIS regardless of the *market participant* responsible for the scheduled transaction (i.e., a Hydro Quebec energy transaction does not have to be scheduled for the sending entity to be meeting its energy obligation, if other transactions deliver an equivalent amount of energy).

Submission of *dispatch data* for transactions associated with the agreements shall adhere to the existing timelines and requirements specified in *Market Manual* 4.2, Section 2.5. The determination of *real-time schedules*, *market schedules*, *market prices*, and *dispatch instructions* for these transactions shall be in accordance with this *market manual*, and as described below.

Winter Period (December 1 to March 31)

To call on Ontario capacity, Hydro Quebec TransÉnergie (HQT) shall issue a reliability declaration to the IESO, and Hydro Quebec Energy Marketing (HQEM) shall submit an associated energy export bid (HQEM export). An advisory notice shall be issued notifying market participants. This HQEM export will be scheduled by the *dispatch algorithm* using normal market mechanisms.

To satisfy the terms of the capacity agreements, the *IESO* may take control actions in the pre-dispatch timeframe to increase the net schedule on PQ.OUTAOUAIS to the MW *bid* quantity of the HQEM export if:

- The HQEM export *bid* price is the *maximum market clearing price (MMCP)*
- The net schedule on PQ.OUTAOUAIS is less than the MW *bid* quantity of the HQEM export, and
- There is sufficient transmission capacity on the interface.

To satisfy the terms of the capacity agreements, the IESO may take control actions in real-time to ensure delivery of energy exports associated with the capacity agreements that are scheduled in pre-dispatch.

These control actions will be made in accordance with Market Manual 7.1: IESO-Controlled Grid Operating Procedures, Appendix B.2: Emergency Operating State Control Actions. Constrained-on exports on PQ.OUTAOUAIS shall be applied on a reasonable effort economic basis using the TLRe code (see Table 1-1).

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Summer Period (June 1 to September 30)

To call on Quebec capacity, the IESO shall issue a reliability declaration[23] to HQT and issue an advisory notice to market participants. Following this, HQEM will submit an associated import *offer* (HQEM import). As in the winter period, this HQEM import will be scheduled by the *dispatch algorithm* using normal market mechanisms.

Consistent with Market Manual 7.1, Appendix B.1, the IESO may constrain on import transactions on a reasonable effort economic basis in advance of or during an emergency operating state. This may include import transactions on PQ.OUTAOUAIS associated with the capacity agreements, with no preferential treatment given to the HQEM import. Manual constraints will be applied using either the TRLi or ADQh code for IESO adequacy (see Table 6-1).

6.4.5 Capacity-Backed Exports

This section provides information on how capacity-backed exports[24] will be maintained or *curtailed.*

In all examples outlined below, it is assumed that the capacity-backed export has been called [25]by the external jurisdiction.

Ontario has Adequate Supply

Capacity-backed exports will be treated like any other export, and will be supplied regardless of the status of the backing resource as long as the export *bid* is economic.

Ontario is Curtailing Exports Bid at +MMCP

When Ontario is curtailing exports bid at *+MMCP* for adequacy shortfalls, a capacity-backed export will not be reduced to less than the *pre-dispatch schedule* of the backing resource provided that the backing resource continues to be scheduled in real-time and injects energy to a level sufficient to fully support the export. The remaining non-capacity backed exports bid at *+MMCP* may be reduced in accordance with *curtailment* provisions laid out in Market Manual 7.1, Appendix B.

The Backing Resource is Derated or on Outage while Called

The *IESO* will *curtail* a capacity-backed export when the *pre-dispatch schedule* or output of the backing resource in real-time is reduced below a level necessary to fully support the related export. As such, Control Room staff will *curtail* the capacity-backed export if an *outage* or derate is received for the resource.

The Backing Resource is Transmission Constrained

The *IESO* may curtail a capacity-backed export if the *pre-dispatch schedule* or the dispatch schedule of the backing resource is below the quantity of the export as a result of the backing resource being constrained down by transmission system limitations. Examples of constraints include transmission security (i.e., for voltage, stability, or thermal transmission limitations); ensuring safety of any person; preventing the damage of equipment; or preventing the violation of any *applicable law*, where *applicable law* includes environmental law.

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[23] In accordance with Market Manual 7.1: IESO-Controlled Grid Operating Procedures, Appendix B.1 Actions in Advance of and During the IESO Controlled Grid Emergency Operating State.

[24] See Market Manual 4.2, section 2.6.

[25] Capacity calls are made by external jurisdictions in response to *energy* and *operating reserve* shortfalls

6.5 Pre-Emptive Curtailments

If the *IESO* determines with reasonable certainty that specific transactions, or a certain volume of transactions, will not be successfully scheduled or will need to be curtailed in real-time due to an internal issue, the *IESO* may remove the affected transactions from the constrained schedule only (using the TLRi code) for future hours.

If the *IESO* determines with reasonable certainty through input from the appropriate scheduling entity that transactions will not be successfully scheduled due to external reliability (security or adequacy), or due to a consistent *market participant* failure (economics or tagging), the *IESO* may remove the anticipated affected transactions from the *IESO* scheduling processes, for future hours and code appropriately.

If an external Reliability Coordinator initiates the *NERC* TLR procedure that has resulted, or is anticipated to result, in transaction failures and it is determined, through input from the appropriate issuing entity, that the TLR will continue for some time into the future, the *IESO* may pre-emptively remove (or reduce to the expected level of delivery) transactions from the applicable pre-dispatch constrained and unconstrained sequences (using the TLRe code). On a reasonable effort basis, the *IESO* will attempt to remove/reduce the transactions as per the IDC process (first by transmission priority bucket, then on a reasonable effort economic basis within the transmission bucket). To prevent an increased schedule to the remaining transactions, the IESO may constrain these transactions to their pre-dispatch value with a TLRe code.

Market participants can visit the *NERC* website at www.nerc.com to confirm whether Transmission Loading Relief Procedures have been implemented.

If pre-emptive curtailments are expected to last for multiple hours, an advisory notice shall be issued notifying *market participants* that this practice is occurring. Another advisory notice shall be issued when the pre-emptive curtailments have ended.

In all cases, pre-emptive curtailments will be made to the same transactions that are expected to be curtailed in real-time on a reasonable effort basis (e.g., economics, transmission priority, etc.).

6.6 Transaction Coding

6.6.1 Principles of Coding

When altering the *pre-dispatch schedule* issued with respect to each *registered facility* that is a *boundary entity*, the *IESO* will abide by the following coding principles:

Principle 1

The *IESO* will only intervene to alter *pre-dispatch schedules* for a given dispatch hour if:

- In the IESO's opinion, as a result of changing conditions, the *real-time schedules* will not have sufficient resources available to maintain the reliable operation of the *IESO-controlled grid*, or
- Consistent with interconnection agreements and industry standards, the *IESO* is requested to do so by another control area or reliability coordinator, or
- The *market participant* has not met all requirements.

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Principle 2

To the extent possible, *IESO* manual changes shall be consistent with the changes that would have occurred if the hour ahead pre-dispatch sequences had recognized the reliability concern.

Principle 3

To the extent practicable, the *IESO* shall limit manual intervention to an amount equal to the difference between the change in conditions and the real-time capability of available internal resources to address that change.

Principle 4

To the extent practicable, the *IESO* shall use the economic merit order of intertie transactions as the basis for determining which transactions to manually adjust.

Principle 5

IESO manual intervention shall impact the same *real-time/pre-dispatch schedule* (constrained or unconstrained) that would have had insufficient resources as a result of the changing conditions, as noted in principle 1.

Principle 6

The *market participant* whose transaction is affected by the *IESO* manual intervention shall be eligible for the same market compensation and be subject to the same risks as if the transaction was scheduled in the hour ahead *pre-dispatch schedule*.

Table 6-1: Application of Interchange Schedule Codes

Transaction Failures		Summary of Codes & Resulting Treatment					
Failure Reasons	**Further Description**	**Code Entered**	**CMSC[26] Treatment**	**DA IFC Exempt (Import)**	**RT IFC Exempt (Import)**	**RT EFC Exempt (Export)**	**DA-IOG Component #2 Treatment**
e-Tagging errors	e-Tagging errors	OTH	No	No	No	No	No
External Jurisdiction Economic Selection Failure (whole or partial)	External Jurisdiction Economic Selection Failure (whole or partial)	OTH	No	No	No	No	No
PJM Ramping Capacity (where ramp reservations required)	Market participant failure to acquire ramping capability.	OTH	No	No	No	No	No
ISO Market Participant Scheduling Errors	Offer errors	OTH	No	No	No	No	No
Linked wheels (within participant control)	Curtailment of linked wheels within participant control	OTH	No	No	No	No	No
e-Tag held by IDC	e-Tag held by IDC following the first hour of the TLR process	OTH	No	No	No	No	No

[26] CMSC eligibility may be impacted by the scenarios defined in Market Manual 5.5: Physical Markets Settlement Statements, section 1.6.28: Limiting Constrained-off CMSC to Interties.

Transaction Failures		Summary of Codes & Resulting Treatment					
Failure Reasons	**Further Description**	**Code Entered**	**CMSC[26] Treatment**	**DA IFC Exempt (Import)**	**RT IFC Exempt (Import)**	**RT EFC Exempt (Export)**	**DA-IOG Component #2 Treatment**
Transaction on a commercially unavailable intertie	Market participant submits a bid or offer based on a commercially unavailable intertie[27]	OTH	No	No	No	No	No
External ISO Curtailments	External ISO Curtailments for TLR (including pre-emptive curtailments)	TLRe	No	Yes	Yes	Yes	No
External ISO Curtailments	Other Security Curtailments	TLRe	No	Yes	Yes	Yes	No
External ISO Curtailments	External ISO Adequacy Cuts	TLRe	No	Yes	Yes	Yes	No
NYISO Ramping Capacity	For NYISO Net Interchange Scheduling Limit (NISL) binding	TLRe	No	Yes	Yes	Yes	No
Linked wheels (outside participant control)	Curtailment of linked wheels outside participant control	TLRe	No	Yes	Yes	Yes	No
Intertie Limit Violation (when caused by an external curtailment or failure)	IESO or external curtailment to respect an intertie limit violation when the violation is caused for a reason where the failure code is tagged as OTH, TLRe or MrNh	TLRe	No	Yes	Yes	Yes	No
Constrain-on export transaction to Quebec	Constrain-on export transaction to Quebec to meet capacity agreement obligation	TLRe	No	N/A	N/A	Yes	N/A
Capacity-backed export reduced for a transmission limitation	Capacity-backed export reduced for a transmission limitation	TLRe	No	N/A	N/A	Yes	N/A
Capacity-backed export reduced due to backing resource status	Backing generator is derated to an amount less that the scheduled quantity and the IESO is in an energy or operating reserve shortfall	TLRe	No	N/A	N/A	Yes	N/A

[27] The *IESO* will issue an advisory notice in real-time when an intertie has been declared commercially unavailable. For any subsequent *bids* or *offers* received against that intertie, the transaction will be curtailed to 0 MW and the *market participant* will be subject to a failure charge.

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Transaction Failures		Summary of Codes & Resulting Treatment					
Failure Reasons	**Further Description**	**Code Entered**	**CMSC[26] Treatment**	**DA IFC Exempt (Import)**	**RT IFC Exempt (Import)**	**RT EFC Exempt (Export)**	**DA-IOG Component #2 Treatment**
IESO Curtailments (Manual)	IESO Curtailments for TLR	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
IESO Curtailments (Manual)	Other Security Curtailments	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
Intertie Limit Reduction (total or partial)	IESO selects and decreases transaction quantity after Hour-Ahead Pre-Dispatch	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
IESO Ramping Capacity (Manual management of Ramp)	For IESO managing transactions to prevent violation of Net Interchange Scheduling Limit (NISL)	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
IESO Curtailments	IESO Adequacy Actions Shortfall beyond next hour (for shifting Energy Limited Resources for future hour shortfall)	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
IESO Curtailments	IESO Adequacy Actions Internal security concerns leading to an adequacy concern.	TLRi	Yes or No based on DSO schedules	Yes	Yes	Yes	Yes
IESO Security Curtailment Operating Reserve Activation	Activation of OR provided by import (increase import schedule) Activation of OR provided by export (reduce export schedule)	ORA	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	Yes	Yes
MISO - Minnesota - Inability to acquire transmission service	Real-Time transaction failures from MISO[28]	MrNh	No	No	Yes	Yes	No
MISO - Michigan - Inability to acquire transmission service	Real-Time transaction failures from MISO[28]	MrNh	No	No	Yes	Yes	No
MISO - Manitoba - Inability to acquire transmission service	Real-Time transaction failures from MISO[28]	MrNh	No	No	Yes	Yes	No

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Transaction Failures		Summary of Codes & Resulting Treatment					
Failure Reasons	**Further Description**	**Code Entered**	**CMSC[26] Treatment**	**DA IFC Exempt (Import)**	**RT IFC Exempt (Import)**	**RT EFC Exempt (Export)**	**DA-IOG Component #2 Treatment**
MISO Ramping Capacity	Market participant inability to acquire ramping capability in real time[28]	MrNh	No	No	Yes	Yes	No
NYISO Curtailments	Cuts by NYISO under HAM protocol due to TLR (NYISO Real-Time transactions, Not NYISO Day-Ahead transactions but could be IESO Day-Ahead Imports)[27]	MrNh	No	No	Yes	Yes	No
IESO Curtailments	IESO Adequacy (Surplus or Deficiency) Actions not caused by internal security. (Dispatching on or off of Imports or Exports after the final hour-ahead pre-dispatch)	ADQh	No	Yes or No based on RT Offer Price Test*	Yes	Yes	Yes
NYISO - IESO Scheduling Protocol	90 Minute Checkout	NY90	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	N/A	Yes
IESO Curtailments (Auto - Automatic treatment by the DSO algorithm)	Other Security Curtailments Constrained Off event (Constrained off with full or partial market schedule quantities)	AUTO or NY90	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	N/A	Yes
IESO Economic Selection (Auto - Automatic treatment by the DSO algorithm)	Constrained Off event (Constrained off with full or partial market schedule quantities)	AUTO or NY90	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	N/A	Yes
Intertie Limit Reduction	Between Pre-Dispatch of Record and Hour-Ahead Pre-Dispatch Import Schedules may be reduced by an Intertie Limit Reduction which may impact Day-Ahead Import Schedules	AUTO or NY90	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	N/A	Yes

[28] This is communicated via the e-Tag and not a phone call to the IESO Control Room.

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Transaction Failures		Summary of Codes & Resulting Treatment					
Failure Reasons	**Further Description**	**Code Entered**	**CMSC[26] Treatment**	**DA IFC Exempt (Import)**	**RT IFC Exempt (Import)**	**RT EFC Exempt (Export)**	**DA-IOG Component #2 Treatment**
IESO Ramping Capacity (DSO Managing Ramp)	For DSO managing transactions to prevent violation of Net Interchange Scheduling Limit (NISL)	AUTO or NY90	Yes or No based on DSO schedules	Yes or No based on RT Offer Price Test*	N/A	N/A	Yes

*** RT Offer Price Test:** If DA Import Scheduled quantity is offered in RT at -MMCP then DA-IFC Exempt.

6.6.2 Methodology for Failure Code Application

TLRi or ADQh when curtailing Exports for Adequacy[29]

When exports are curtailed for adequacy there are two states:

(i) an adequacy concern that is caused by an internal security limitation resulting in resources being bottled and not being available for dispatch. When we observe an adequacy concern due to bottled resources in real-time, our Control Room staff will apply the TLRi code to an amount of curtailed export transactions equal to the quantity of bottled MWs in the current system configuration. The TLRi code does not adjust the market schedule, and

(ii) a global adequacy issue resulting from insufficient offers in the market. When we observe a global adequacy issue in real-time, our Control Room staff will apply the ADQh code. The ADQh code causes the market schedule to be adjusted to match the dispatch schedule.

When we have applied the TLRi code, we will perform an after-the-fact analysis to verify that the correct code was applied. Specifically, we will examine the market schedule for those intervals where we curtailed exports in the dispatch schedule. If the market schedule did not result in a shortage for energy or operating reserve, this indicates that there was no global adequacy issue and that TLRi was the correct code to apply. If the market schedule did result in a shortage for energy or operating reserve, we will change the code from TLRi to ADQh. The effects of any events that occur following the time that the exports are curtailed, which result in a shortage in the market schedule, will not be considered in the analysis of the original TLRi application.

When we have applied the ADQh code, we will perform an after-the-fact analysis to verify that the correct code was applied. To do this, we will rerun the unconstrained sequence with the amount of curtailed export MWs now included and assess the resulting market schedules. In order to rerun the sequence, we must retrieve a saved copy of the *pre-dispatch* run or a save case. In such an instance,

- If the curtailment was made prior to the *dispatch* hour, the *pre-dispatch* run prior to the curtailment will be retrieved to be used as the save case. This save case will be adjusted with the most up-to-date data known at the time of the curtailment. For example: all import and export transactions will be fixed as per the *pre-dispatch* results while any generation losses, import curtailments, etc. will be reflected by adjusting the save case, or

[29] The TLRi code may result in CMSC payments while the ADQh will not

- If the curtailment was made in the dispatch hour, the real time run of the interval in which the curtailment took place will be retrieved to be used as the save case. This save case will be adjusted with the most up-to-date data known at the time of the curtailment.

If the resultant market schedule does not indicate a shortage for energy or operating reserve, the code will be changed to TLRi, as appropriate. If the resultant market schedule indicates a shortage of energy or operating reserve, the *IESO* will apply TLRi to the export transactions equal to the amount of export MWs that could be supported by the market schedule without shortages, and will apply ADQh to the remainder.

Any changes in coding that affect the market schedule will be reviewed under the administered pricing guidelines.

External curtailment that causes an Intertie Limit Violation

In the case where an external entity curtails a transaction or a transaction fails due to participant behaviour, the IESO removes the transaction from the schedule and codes the transaction with TLRe, MrNh or OTH. If the curtailment of this transaction causes the intertie limit to be violated, the IESO will take immediate action to relieve the violation. Because this violation is on the intertie, the violation cannot be solved by internal generation. On all interties, with the exception of Quebec, we are unable to constrain on another transaction and therefore must curtail a transaction.

This further transaction will be coded using TLRe based on the coding principles established at market opening.

If the *pre-dispatch sequence* had known about the external problem before the hour-ahead pre-dispatch run, the bid or offer for the externally curtailed transaction would have been removed and the second transaction would not have been scheduled in either schedule due to the scheduling limits.

Market participants can visit the *NERC* website at www.nerc.com to confirm whether Transmission Loading Relief Procedures have been implemented.

– End of Section –

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7. Issuing Dispatch Instructions

7.1 Registered Facilities (other than HDR resources and boundary entities)

The *IESO* issues *dispatch instructions* for each *registered facility,* except for *boundary entities, HDR* resources or *variable generators,* prior to each *dispatch interval*. The IESO issues *dispatch instructions* to each *variable generator* only for the *dispatch intervals* that have mandatory obligation indicators.[30] The *dispatch instruction* for that *dispatch interval* indicates the following:

- The target *energy* level to be achieved (in MW) by the *facility* at the end of the *dispatch interval* at a rate, in the case of a *dispatchable load*, equal to the rate provided by the *market participan*t as *dispatch data*, and, in the case of a *generation facility,* equal to the most limiting of:
    - The last *dispatch instruction* and offered ramp rate, or
    - Actual MW output and the *generation facility's* effective maximum ramp rate.[31]
- The amount of each class of *operating reserve* that is to be in a condition to respond to a *dispatch* instruction calling for additional *energy* production (as described below).

Dispatch instructions may also identify the amount of reactive support and *regulation* range to be provided under *ancillary service* contracts during the *dispatch interval*[32].

The *IESO* issues *release notifications* to each *variable generator* for the first *dispatch interval* when the mandatory obligation indicator for its *variable generation* no longer exists.

The *dispatch instructions* for any *registered facility* will be consistent with the current operating status of that *registered facility*, any operational constraints described in the most recent *dispatch data* submitted by the *registered market participant* for that *registered facility*, and with the *market entry* data maintained by the *IESO*.

The *IESO* will only issue *dispatch instructions* for a *registered facility*, other than a *boundary entity*, for a given *dispatch interval* when there is a change in the quantity to be scheduled from that *registered facility* for the *dispatch interval* relative to the last *dispatch* instruction issued to the *registered facility* (and confirmed by the *registered market participant*) provided,

[30] An obligation indicator is a piece of text information that accompanies *dispatch instructions* and *release notifications* sent to *variable generation* through the *IESO* automated dispatch systems. The value of the obligation indicator is either "mandatory," denoting a *dispatch instruction* that must be followed, or "release," denoting a *release notification*.

[31] The effective maximum ramp rate will be determined based on the lower of the r*egistered* maximum ramp rate, provided by the *market participants* and contained in the participant registration data, or the maximum *offer* ramp rate x the ramp rate multiplier. Initially the value of the ramp rate multiplier will be established at a value of 1.2 for all resources.

[32] Where the *IESO* activates *ancillary service* contracts for reactive support and *regulation* range, such contracts will be typically activated for a number of consecutive *dispatch* intervals as part of a single *dispatch* instruction.

- The new *dispatch instructions* for provision of *energy* change from the previous *dispatch instruction* issued is greater than the lesser of 2% of the maximum *offer/bid* capability and 10 MW except:

- To ensure *energy* resources are correctly dispatched to its high operating limit, or its low operating limit, when the *dispatch instructions* change falls within the filter thresholds,
- For provision of *energy* reduction change when the previous *dispatch instructions* is higher than its current maximum *offer*, when the *dispatch instructions* change falls within the filter thresholds, and
- For interval 1 and 7 of each *dispatch hour* when filtering is turned off to ensure small recurring increments or decrements of *energy* that have been legitimately offered by *market participants* are issued *dispatch instructions* on the hour and the half hour, when the change falls within the filter thresholds.

Note: The filter prevents *dispatch instructions* for small changes in scheduled quantities to be issued, except as noted above. The *IESO* may issue *dispatch instructions* within the *dispatch interval*, instructing any *registered facility* with a valid *energy bid* or *offer*, to increase or decrease *energy* production or consumption, consistent with its submitted *bids* or *offers*. Except for a *dispatch instruction* issued to a *market participant* with a *dispatchable load bid* at MMCP, *market participants* must acknowledge the submitted *dispatch instructions* or *release notifications* for each *dispatch interval* within 60 seconds of receipt of the instruction by confirming its intention to comply (or not comply) with the instruction.

If a *response* to the *dispatch* instruction or *release notification* is not received within 60 seconds, the *registered market participant* has an additional 30 seconds to call and have the *IESO* manually accept or reject the *dispatch* instruction or *release notification* on its behalf. Confirming that a *registered facility* will not comply with a *dispatch* instruction, or the failure to acknowledge the *dispatch instruction* or *release notification* will trigger the compliance process described in Section 7.5.

A *dispatchable load* in its "**normal**" *energy* withdrawal pattern with a varying load, which includes a brief period when it may not be following the *dispatch instruction*, as permitted by its exemption, is still required to acknowledge the submitted *dispatch instructions* for each *dispatch interval*. A *dispatchable load* is not however, required to reject the *dispatch instruction*[33] if **not** in its "**normal**" *energy* withdrawal pattern, but is required to:

- Notify[34] the *IESO* of its inability to follow the *dispatch instruction*,
- Notify[36] the *IESO* to request approval to change the *dispatch data* and/or to resume *energy* withdrawals, and
- If the dispatch instruction relates to operating reserve, notify[36] the IESO:
    - When the deviation from dispatch is expected to be greater than 10 minutes and the *dispatch instruction* is for 10 minute *operating reserve*, or

[33] In some circumstances automated *dispatch instruction* may not be available due to the actions of the **Resource Dispatch Filter** tool.

[34] Notification is by telephone, unless otherwise approved by the *IESO*.

- When the deviation from dispatch is expected to be greater than 30 minutes and the *dispatch instruction* is for 30 minute *operating reserve*.

Where a *contingency event* is occurring or has occurred, the *IESO* may temporarily cease issuing *dispatch instructions* in accordance with this procedure[35]. If the *IESO* fails to issue *dispatch instructions* to any *registered market participant* with respect to a *registered facility*, that *registered market participant* should use as its default *dispatch instructions* the most recent *dispatch instruction*s issued by the *IESO* in respect of that *registered facility*.

The *IESO* records and time-stamps all *dispatch instructions* and store these records for at least seven years.

Table 7-1: Procedural Steps for Dispatch Instructions for Registered Facilities (other than HDR resources and boundary entities)

Step	Completed by…	Action
1	*IESO*	The *IESO* executes a number of internal processes using different software tools and manual processes to schedule resources to supply *energy* and *operating reserve* to meet requirements.
2	*IESO*	The *IESO* issues *dispatch instructions* to the *registered market participant* for each of its *registered facilities*, where there is a change in the quantity to be scheduled from the *registered facility* relative to the last *dispatch* instruction issued to the *registered facility*. The *IESO* will also issue *dispatch instructions* for each *market participant* that is also a *variable generator* when there is a change in the obligation indicator to a mandatory *dispatch instruction* or a *release notification* relative to the last *dispatch instruction* issued to the *variable generator.* The *IESO* will seek to ensure that the *dispatch instructions* issued with respect to each *registered facility* for each *dispatch interval* closely approximate the most recent *real-time schedule* for that *registered facility* and *dispatch interval*. The *IESO* may, however, issue *dispatch instructions* that depart from the *real-time schedule* where: • The *security* and *adequacy* of the system would be endangered by implementing the most recent *real-time schedule*, • The *dispatch* algorithm has failed, or has produced a *real-time schedule* that is clearly and materially in error, • The *dispatch algorithm* has produced a *real-time schedule* that does not accurately reflect the *minimum run-time* or lockout[36] status of a *facility* due to *dispatch algorithm* limitations, • Material changes subsequent to determination of the most recent *real-time schedule*, such as failure of an element of a *transmission system* or failure of a *registered facility* to follow *dispatch instructions*, have occurred, or

[35] Typically, this will be as a result of a *market suspension* (refer to *Market Manual* 4.5*)*. However, short-term contingencies, such as a temporary systems failure may result in the temporary cessation of automated *dispatch* instructions without suspending the market. In such case, the *IESO* will manually *dispatch* the *market participant* resources.

[36] As defined in section 6.1.

Step	Completed by…	Action
		• The operation of all or part of the *IESO-administered markets* has been suspended (refer to Market Manual 4.5 for more information). The *IESO* records and time-stamps all *dispatch instructions* that are submitted to *market participants*.
3	***Market Participant***	The *market participant* **receives the *dispatch instruction*** from the *IESO* along with a dispatch advisor report and acknowledges the *dispatch* instruction by **confirming to the *IESO* that the *registered facility* will accept or reject** the *dispatch* instruction.
4	*IESO*	The *IESO* confirms whether the *market participant* has accepted or rejected the *dispatch instruction*. If a *response* to the *dispatch instruction* is not received within 60 seconds, the *registered market participant* has an additional 30 seconds to call and have the *IESO* manually accept or reject the *dispatch instruction* on its behalf[37]. The *IESO* may also contact the *market participant* by phone and, in accordance with the instructions of the *market participant*, manually accept or reject the *dispatch instruction* on behalf and on the instruction of the *market participant*. Alternatively, if the *registered market participant* does not accept or reject the *dispatch instruction*, nor does it request the *IESO* to manually accept or reject the *dispatch instruction* on its behalf, the instruction will be deemed to have been rejected by the *registered market participant*. For *dispatch instructions* that are rejected or for which no *response* has been received: • The *registered market participant* is required to maintain its *facility* loading at the level of the last accepted *dispatch instruction*, and • These instances are deemed non-compliant and will trigger the compliance process.
5	***Market Participant***	A *market participant* that expects its *registered facility* to operate in a manner that, for any reason, differs materially from the *IESO*'s *dispatch instructions* shall so **notify the *IESO*** as soon as possible.

[37] Two items of note regarding *IESO* manual acceptance/rejection of *dispatch instructions* on behalf and on the instruction of *market participants*:

- Ninety seconds after the *dispatch instruction* has been issued, the *dispatch* messaging tools locks out the *IESO* from completing manual actions. Therefore, *Market Participants* must call the *IESO* before the 90-second timer times-out and provide sufficient time for the *IESO* to complete this activity. The *IESO* will manually accept or reject *dispatch instructions* on behalf and on the instruction of *Market Participants* on a reasonable effort basis. The *IESO* may be unable to complete manual acceptance/ rejection for reasons such as delays in contacting the *IESO*, the length of time it takes the *IESO* to locate a specific *dispatch instruction* in the *dispatch* messaging tools, or because of *IESO* workload. Consequently, the *IESO* does not guarantee that it can manually accept or reject any or all *dispatch instructions* on behalf and on the instruction of *Market Participants*.
- If the *IESO* is not able to manually accept a *dispatch instruction* on behalf and on the instruction of a *market participant*, the *market participant* is required to maintain its *facility* loading at the level of the last accepted *dispatch instructions*.

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Step	Completed by…	Action
6	*IESO*	If a *market participant* for a *registered facility*: • Confirms that it is rejecting a *dispatch instruction*, or • Does not acknowledge the *dispatch instruction*, or • Notifies the *IESO* that the *facility* will be (or is) operating in a manner that differs materially from the *dispatch* instructions, The *IESO* will assess the resource shortfall. The *IESO* may address the resource shortfall by determining that: • New *dispatch instructions* are required (this could include activation of *operating reserve*), or • An *emergency operating state* must be declared.
7	*IESO*	When insufficient resources are available via normal market mechanisms to address a resource shortfall, the *IESO* will declare an *Emergency Operating State*[38].
8	***Market Participant***	*Market participants* **access the *IESO* public website** to view the most recent advisory notice. The advisory notice contains a System *Emergency* Advisory indicating that an *Emergency Operating State* is expected.
9	*IESO*	During commissioning of a *generation unit*, the *IESO* may be required to carry additional reserve because of the increased likelihood of unit failure. The *IESO* may contact any *facility* conducting commissioning tests and requests that these tests halt. In some instances, stopping a commissioning test may lead to a shutdown of a generating unit. In these cases, judgment is used where the *energy* provided by the commissioning unit is more valuable than the advantage received by reducing the reserve requirement. Note that commissioning units are self-schedulers and price-takers. Discontinuing commissioning tests here does not mean that the *IESO* must allow short-notice *offers* within the mandatory *bid* submission window.
10	***Market Participant***	*Market participant* **receives and complies with the *IESO* request to discontinue its commissioning test**. The *market participant* also **informs the *IESO* that the commissioning test has been halted**.
11	*IESO*	Implement actions to continue to satisfy 10-minute *operating reserve* requirements. Refer to *Market Manual* 7.1: IESO-Controlled Grid Operating Policies, Appendix B: Emergency Operating State Control Actions.
12	*IESO*	The *IESO* issues *NERC Energy Emergency* Alert 2 (EEA-2) indicating that the *IESO control area* has or is about to initiate load management procedures.

[38] Refer to *Market Manual* 7.1: *IESO*-Controlled Grid Operating Policies, Appendix B for the complete integrated list of *emergency operating state* control actions.

Step	Completed by…	Action
13	*IESO*	Implement actions to continue to satisfy 10-minute **synchronized** *operating reserve* requirements. Refer to *Market Manual* 7.1, Appendix B.
14	*IESO*	When insufficient resources are available via normal market mechanisms to address a resource shortfall, the *IESO* will declare an *Emergency Operating State*[39]. To declare an *emergency operating state*, the *IESO* issues System *Emergency* Advisories via an advisory notice. Usually, two advisories are issued: one indicating the potential for an *emergency operating state* (see step 7) and another indicating that an *emergency operating state* has been declared.
15	***Market Participant***	*Market participants* **access the *IESO* public website** to view the most recent advisory notice. The advisory notice contains a System *Emergency* Advisory indicating that an *Emergency Operating State* has been declared.
16	*IESO*	The *IESO* implements *emergency operating state* control actions to continue to satisfy 10-minute synchronized *operating reserve* requirements, as described in *Market Manual* 7.1, Appendix B.
17	*IESO*	Implement actions to meet *regulation* reserve requirements. Refer to *Market Manual* 7.1, Appendix B.
18	***Market Participant*** *(Transmitters* and/or *Distributors)*	*Transmitters* and/or *distributors* receive and accept instructions to reduce voltage at the distribution level either by 3%, or subsequently, by 5%.
19	*IESO*	Implement actions to avoid implementation of *non-dispatchable load curtailment*. Refer to *Market Manual* 7.1, Appendix B.
20	***Market Participant*** *(Generators)*	*Generators* apply for environmental variances in order to supply more *energy* to the at-risk *IESO-controlled grid*.
21	*IESO*	The *IESO* issues *NERC Energy Emergency* Alert 3 (EEA-3) indicating that load interruption is imminent or in process.
22	*IESO*	The *IESO* curtails *non-dispatchable load* through *emergency* or rotational load shedding. *Market participants* are alerted that load shedding is imminent followed by specific instructions for *emergency* load shedding or controlled rotational load shedding.

[39] Refer to *Market Manual* 7.1, Appendix B for the complete integrated list of *emergency operating state* control actions.

Step	Completed by…	Action
23	***Market Participant*** *(Transmitters* and/or *Distributors)*	*Transmitters* and/or *distributors* receive instructions from the *IESO* via telephone to *curtail non-dispatchable load*.

7.2 Hourly Demand Response Resources

The *IESO* issues a standby notice via the standby report to the *Demand Response Market Participant (DRMP)* to indicate that an *HDR* resource is on standby to provide demand response (refer to Market Manual 9.3: Operation of the Day-Ahead Commitment Process).

The *IESO* may subsequently issue a *dispatch instruction* to the *DRMP,* in the form of an activation notice, by publishing an activation report to the *DRMP's* private report site. An activation notice is issued when the relevant pre-dispatch schedule for each *dispatch hour* is less than the resource's total *bid* quantity for at least four consecutive hours during the *dispatch day* availability window. The activation notice is issued approximately 2 hours and 30 minutes before the start of the first *dispatch hour* to which it relates. The activation notice specifies the target reductions in energy to be withdrawn (in MW) by the *HDR* resource for each *dispatch hour* of the four consecutive hours of demand response. The *DRMP* is expected to achieve its target by the end of the first five-minute interval of each hour and maintain it for the entire hour.

If an activation notice is not received for the first hour of the availability window, the *DRMP* must continue to monitor for the receipt of an activation notice resulting from subsequent runs of *pre-dispatch* until the end of the availability window. However, if the *DRMP* has submitted bids for an *HDR* resource outside the availability window and has received an activation notice, the *DRMP* is expected to comply with that activation notice.

If a standby report indicates that the *HDR* resource is not required to be on standby, then the *DRMP* is not required to provide demand response with that *HDR* resource for that *dispatch day.* The *DRMP* must remove the *HDR* resource's *dispatch data* before 09:00 EST. Failure to do so may result in the *HDR* resource receiving an activation notice with the requirement to reduce *energy* withdrawal.

The *dispatch instructions* for any *registered facility* that is an *HDR* resource will be consistent with the current *dispatch data* for that *registered facility.*

7.2.1 Dispatch Instructions for HDR Resources

The *IESO* will notify *DRMPs* with *HDR* resources that may be required for demand response by issuing a standby notice in the standby report, published to the private *market participant* report site. If required to provide *demand response*, the *IESO* will issue *dispatch instructions* to *HDR* resources in the form of an activation notice 2 hours and 30 minutes in advance of each *dispatch hour.* Activation notices will be published to the private *market participant* report site. The *DRMP* is not required to formally acknowledge the *dispatch instruction*. It is expected that the *dispatch instructions* will be followed unless the *IESO* has been notified that the *HDR* resource is unable to comply.

Table 7-2: Procedural Steps for Dispatch Instructions for HDR Resources

Step	Completed by…	Action
1	***DRMP***	A *DRMP* that wants to meet their *demand response capacity obligation* for an *HDR* resource must **submit *demand response energy bids***. Submission of *dispatch data* will follow the requirements identified in *MR* Ch. 7 Sec. 3 and Market Manual 4.2.
2	*IESO*	The *IESO* pre-dispatch sequences schedule *energy* and *operating reserve* (including imports) to satisfy the *non-dispatchable load* + losses prediction provided by the Load Forecast tool and to satisfy economic *bids* from *dispatchable loads* (including load *bids* from *intertie zones*).
3	*IESO*	The *IESO* publishes a standby report to the private *market participant* report site. If the *HDR* resource is on standby to provide DR for the *dispatch day,* the standby report will include a standby notice. A standby notice is issued when the HDR resource's day-ahead *schedule of record* or *pre-dispatch schedule* is less than its total bid quantity for at least four consecutive hours during the *dispatch day* availability window. The absence of a standby notice in the standby report indicates the HDR resource is not on standby to provide DR.
4	***DRMP***	If the standby report indicates that the *HDR* resource is not on standby (absence of standby notice), the ***DRMP* must remove *dispatch data* before 09:00 EST**. Failure to do so may result in the *HDR* resource receiving an activation notice.
5	*IESO*	The *IESO* issues *dispatch instructions* to the *DRMP* for *HDR* resources: • When the *HDR* resource's *pre-dispatch* schedule is less than the resource's total *bid* quantity for at least four consecutive hours during the dispatch day availability window. • By issuing an activation notice to individual *market participant* private report site.
6	***DRMP***	Upon receipt of the activation notice, **the *DRMP* implements the actions required to comply** with the d*ispatch instructions,* by reducing energy withdrawal for each *HDR* resource to meet the d*ispatch instructions* issued by the *IESO.*
7	***DRMP***	A *DRMP* that expects the *HDR* resource to operate in a manner that, for any reason, differs from the *IESO*'s *dispatch instructions* shall **notify the *IESO*** as soon as possible.
8	***DRMP***	A *DRMP* that expects the *HDR* resource to operate in a manner that, for any reason, differs from the *IESO*'s *dispatch instructions* shall **change their *dispatch data*** as soon as possible.

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7.3 Boundary Entities

The *dispatch instructions* for any *registered facility* that is a *boundary entity* will be consistent with the current *dispatch data* for that *registered facility* and with any *interconnection* limitations associated with the *registered facility*.

Interchange schedules may be modified within the hour as a result of instructions from an external *control area*, or due to contingencies or other *reliability* concerns in the *IESO control area*. In the instances where the schedule modification originates from sources external to Ontario (e.g., implementation of Transmission Loading Relief, by an external *control area*), the *IESO* will ensure that the schedule modification does not trigger a Congestion Management Settlement Credit (CMSC) payment.

A *registered facility* that is a *boundary entity* shall comply fully with all *dispatch instructions* for *energy* or *operating reserves* upon confirmation of the relevant *interchange schedule* with the appropriate scheduling entity.

The *IESO* expresses *interchange schedule* MW quantities to the nearest one decimal point. However, the e-Tag software, used to obtain e-Tags for import and export transactions, requires persons to express *energy* quantities in whole MW. As a result, *boundary entities* may have to round up or down their *interchange schedule* MW quantities in order to obtain an e-Tag. To ensure that the *energy* quantities expressed by *boundary entities* for the purpose of obtaining their e-Tags correspond to the *real-time schedule*, the *IESO* requires all *boundary entities* to round-up or down the *interchange schedule* MW quantities according to the following rounding rules.

Interchange schedule value	Rounding Rule	Example
X.1 to X.4	Round down	41.3 MW must be rounded down to 41 MW
X.6 to X.9	Round up	20.7 MW must be rounded up to 21 MW
X.5	Call the *IESO* to find out the actual MW quantity to be used to obtain or revise the e-Tag.	For 35.5 MW, call the *IESO* for instructions

The *IESO* records and time-stamps all *dispatch instructions* and stores these records for at least seven years.

7.3.1 Dispatch Instructions for Boundary Entities

Prior to each *dispatch hour*, the *IESO* issues *dispatch instructions* to each *boundary entity*, in the form of *interchange schedules (published to the Market Participant Interface)*, indicating for that *dispatch hour*:

- The *energy* level to be injected, or withdrawn, (in MW) by the *boundary entity* resource from, or to, the specified *intertie zone*,
- The amount of each class of *operating reserve* that is scheduled, and
- The amount of reactive support and regulation that is to be provided under reliability must-run contracts.

The *registered market participant* for each *facility* must submit an e-Tag with a quantity that matches the *IESO dispatch instruction* – the *IESO* will use the e-Tag submission as confirmation of

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the interchange *dispatch instruction*. The *IESO* will verify that the e-Tag has been submitted correctly and will confirm *interchange schedules* with adjacent c*ontrol areas*. At any time in the process, the *IESO* may alter *interchange schedules* due to incorrect or missing e-Tags, scheduling differences with adjacent c*ontrol areas*, and *reliability* or other concerns. Following these changes, the *IESO* will inform the *market participant* of the changes and alter the m*arket schedule* to equal the interchange *dispatch instructions* where appropriate. The *market participant* will update their e-Tags and/or *dispatch data* where appropriate.

Table 7-3: Procedural Steps for Boundary Entity Dispatch Instructions

Step	Completed by…	Action
1	***Market Participant***	**Create an e-Tag** for the *interchange schedule* and obtain a e-Tag ID. **Note:** The *market participant* is required to submit the e-Tag by 30 minutes prior to the *dispatch hour* (35 minutes in advance of the *dispatch hour* to support re-allocation for *NERC* Transmission Loading Relief procedures). See step 13.
2	***Market Participant***	**Submit *dispatch data* from *intertie zones*.** *Dispatch data* shall be accompanied by an e-Tag ID. Submission of *dispatch data* will follow the requirements identified in *MR* Ch. 7 Sec. 3 and Market Manual 4.2.
3	***Market Participant***	**Receive schedule for *interchange schedules* for another c*ontrol area* market.** To successfully complete an *interchange schedule*, the *market participant* must also successfully navigate markets in external c*ontrol areas*. If a *market participant* is scheduled in another market for a quantity that is less than the quantity offered or *bid* in the *IESO-administered markets*, the *market participant* must revise the e-Tag. If it is more than 60 minutes in advance of the *dispatch hour*, the *market participant* must revise the *dispatch data* to include the updated e-Tag ID and to lower the *offer*/*bid* quantity to equal the other *control area* schedule. If it is less than 60 minutes in advance of the *dispatch hour* but the *market participant* has submitted *dispatch data* for subsequent hours that use the same e-Tag, the *market participant* must: • Revise *dispatch data* for these hours to include the updated e-Tag ID, and • Notify the *IESO* of the potential mismatch between the *dispatch data* quantity available and the amount scheduled by another c*ontrol area*.
4	***Market Participant***	**The e-Tag must be revised if** the *market participant* is scheduled by the *IESO* or by an adjacent c*ontrol area* for a quantity that is different than the e-Tag quantity listed for that *interchange schedule.* Where a *market participant* receives *interchange schedule*s from two or more c*ontrol areas*/markets that differ in quantity for the same *interchange schedule*s, the *market participant* will revise the e-Tag quantity to a value that equals the smallest amount scheduled by the c*ontrol areas*/markets.

Step	Completed by…	Action
5	***Market Participant***	If a *market participant* has revised the e-Tag and acquired a new e-Tag ID, then: • If it is more than 60 minutes in advance of the *dispatch hour*, the *market participant* must **revise the *dispatch data*** to include the updated e-Tag ID and to lower the *offer*/*bid* quantity to equal the other CA schedule, and submit the revised *dispatch data* to the *IESO*, or • If it is less than 60 minutes in advance of the *dispatch hour*, but the e-Tag ID has also been submitted to the *IESO* for interchange *offers*/*bids* for future hours, the *market participant* **must revise the *dispatch data*** to include the updated e-Tag ID for these hours, and submit the revised *dispatch data* to the *IESO*.
6	*IESO*	*Dispatch data* for interchange is validated as all *dispatch data* is validated. *Dispatch data* validation details are covered in a number of documents, including Market Manual 4.2. In addition, for interchange *offers*/*bids* only, the *dispatch data* is checked to ensure that only the valid market scheduling points (MSP) are allowed to be submitted for a chosen constrained scheduling point (CSP).
7	*IESO*	The *IESO pre-dispatch* sequences schedule *energy* and *operating reserve* (including imports) to satisfy the *non-dispatchable load* + losses prediction provided by the Load Forecast tool and to satisfy economic *dispatchable load bids* (including load *bids* from *intertie zones*). The schedules of injections/withdrawals for the next hour are provided as inputs to the real-time sequences.
8	*IESO*	The *IESO* issues *dispatch instructions*, in the form of *interchange schedules*, to each *registered facility* that is a *boundary entity* for which a *dispatch instruction* is required.
9	***Market Participant***	*Market participants* are expected to **watch for *interchange schedules*** issued by the *IESO* as part of the *pre-dispatch schedule* production process. *Market participants* **identify linked wheeling *interchange schedules*** whose import and/or export component was not scheduled for the next hour and cancel the associated e-Tag. Cancellation of the e-Tag is only allowed for linked wheeling *interchange schedules* (that consist of an import that has *offered* between -$50 and *–MMCP* and a corresponding export that has *bid* +*MMCP*). If one leg of the wheel *offered*/*bid* in this manner is scheduled for a reduced quantity, the *market participant* will revise and submit an e-Tag for the wheel with the lowered quantity.
10	*IESO*	The *IESO* will review next hour's *interchange schedule* to determine if changes to interchange *dispatch instructions* are required. For example, *interchange schedules* will be altered if system *reliability* would be endangered by implementing the schedule (*MR* Ch. 7 Sec. 7.2 identifies situations where the *IESO* will issue *dispatch instructions* that deviate from the *published* schedule). When the review of *interchange schedules* for next hour reveals that changes are

Step	Completed by…	Action
		required, the *IESO* will adjust the schedules in the **Interchange Scheduler** tool. The *IESO* will identify and cancel linked wheeling *interchange schedule*s whose import and/or export component was not scheduled or was partially scheduled for the next hour and for which associated e-Tags were submitted. In case one component (import or export) of a linked wheeling *interchange schedule*s was partially scheduled, the *IESO* will alter pro rata the schedule for the other component. **Note:** Linked wheeling *interchange schedule*s are described in Market Manual 4.2, Section 2.5.4 and consist of an *offer* between -$50 and –*MMCP* for the import and a *bid* at +*MMCP* for the export.
11	*IESO*	The *IESO* contacts *market participants* to inform them only if their *interchange schedules* have been altered relative to the quantities published to the Market Participant Interface at the conclusion of the *pre-dispatch* run to maintain system *reliability*.
12	***Market Participant***	**Receive notice of *interchange schedule* alterations**. The *market participant* is informed that *interchange schedule(*s) have been altered relative to the quantities published to the Market Participant Interface at the conclusion of the pre-dispatch run.
13	***Market Participant***	*Market participant* **submits the e-Tag** that is consistent with the *dispatch data* submitted to the *IESO* (if submitted in advance) or that is consistent with the *interchange schedule* provided by the *IESO* and other c*ontrol areas*/markets for that *interchange schedule*. See step 1.
14	*IESO*	*IESO* tools automatically indicates that the e-Tag has been submitted. The *IESO* will examine the e-Tag to ensure that is has been submitted correctly (e.g. CSP and MSP of the e-Tag and schedule match, quantity and format is correct etc.) and approve the e-Tag. If not, the *IESO* may contact the *market participant* by telephone to correct and re-submit the e-Tag. If the *market participant* has not submitted the e-Tag promptly, the *IESO* may contact the *market participant* and direct them to submit the e-Tag.
15	*IESO*	Upon reviewing the *interchange schedule* for the next hour, the *IESO* will cancel *interchange schedule*s() if: • The e-Tag has not been submitted, • The e-Tag has not been submitted correctly (in those cases where the *IESO* has not elected to contact the *market participant* to correct the e-Tag), • They are part of linked wheeling *interchange schedule*s that did not get scheduled (these linked *interchange schedule*s consist of an *offer* between -$50 and –*MMCP* for the import and a *bid* at +*MMCP* for the export), • A schedule for *operating reserve* will impact upon a TLR'd flowgate (but can't be reduced via re-allocation because the associated *energy interchange schedule* is 0 MW), or • Required to maintain system *reliability*.

Step		
		Cancelled *interchange schedule*s will be removed by the *IESO* from the Interchange Scheduler (IS) tool.
16	*IESO*	When another *control area* has initiated re-allocation of *interchange schedule*s to protect an overloaded flowgate, the *IESO* may receive a list of *interchange schedule*s that must be reduced or curtailed. If the *IESO* receives such a list of *interchange schedule*s, the *IESO* will reduce the *interchange schedule*s quantities accordingly. If the re-allocation reduce or curtail one component (import or export) of a linked wheeling *interchange schedule*s, the *IESO* will reduce proportionally or curtail the *interchange schedule*s for the other component.
17	*IESO*	*IESO* confirms the quantity and e-Tag ID for each *interchange schedule*s with adjacent c*ontrol areas*. For *operating reserve* schedules, the *IESO* confirms quantities on a per-*interchange schedule* basis. If the quantities recorded by the *IESO* and the other c*ontrol area* are different, the interchange quantity for the *interchange schedule*s will be changed to the lower of the two quantities. The *IESO* and/or adjacent c*ontrol areas* may alter *interchange schedule*s if required to maintain system *reliability*.
18	*IESO*	Following confirmation of the *interchange schedule*s with adjacent c*ontrol areas*, the *IESO* will reduce the IS schedule quantities when they must be decreased to match the amounts scheduled by the adjacent c*ontrol area*. If one component (import or export) of a linked wheeling *interchange schedule*s was altered, the *IESO* will alter pro rata the *interchange schedule*s for the other component.
19	*N/A*	Ramps of *energy* between *control areas* are initiated over 10 minutes. *Energy* ramps typically begin at five minutes to the *dispatch hour*.
20	*IESO*	The *IESO* contacts *market participants* to inform them of *interchange schedule*s that have been reduced, curtailed or cancelled relative to the quantities published to the Market Participant Interface at the conclusion of the pre-dispatch run.
21	***Market Participant***	**Receive notice of *interchange schedule* alterations.** The *market participant* is informed that *interchange schedule(*s) have been reduced, curtailed or cancelled relative to the quantities published at the conclusion of the pre-dispatch run.
22	*IESO*	The *IESO* will alter the *market schedule* for reduced/cancelled *interchange schedule*s. When reducing/canceling one component (import or export) of a linked wheeling *interchange schedule*s, the *IESO* will also reduce/cancel the other component. The *market schedule* will be altered so that the *market schedule* quantities equal

Step	Completed by…	Action
		the *interchange schedule* is quantities provided to the real-time constrained *dispatch* sequences.

7.4 Dispatch of Operating Reserve (OR)

Each *registered facility* to which the *IESO* has sent *dispatch instructions* relating to *operating reserve* must maintain generation (or load reduction) capacity during that *dispatch interval*, consistent with the *dispatch instructions* issued to it. It should be able to increase *energy* production, decrease *energy* withdrawal or be able to schedule, in accordance with the class[40] of *operating reserve* being offered, upon being instructed to do so by the *IESO* as a result of a *contingency event*.

Where a *contingency event* has occurred or is occurring, the *IESO* may issue revised *dispatch instructions* within the *dispatch interval*. The revised *dispatch instructions* will instruct a *registered facility*, other than a *boundary entity*, providing *operating reserve* to begin increasing *energy* production (in the case of a *generator*) or reducing *energy* withdrawal (in the case of a *dispatchable load*) at a rate equal to the *operating reserve* ramp rates provided in the *dispatch data* submission.

A *dispatchable load* must reduce its' consumption, or remain at a reduced consumption level, to provide at least the amount of *operating reserve* requested.

Dispatch instructions issued in respect of an *operating reserve* activation must be accepted to indicate the registered facility will comply with the instruction and that the *market participant* will only alter its dispatch when it receives a new *dispatch instruction*.

Dispatch instructions issued in respect of a *registered facility* that is a *boundary entity* providing *operating reserve* will be such that they ensure that the *energy* associated with each *offer* of *operating reserve* is scheduled by the *IESO* in a manner that:

- Is consistent with all relevant *reliability standards* for activation of *operating reserve*, and
- Is as agreed upon by the entity scheduling the resulting *energy* transfer.

When issuing *dispatch instructions* to *registered facilities* providing *operating reserve*, the *IESO* will call first on the *registered facility* in each area that has offered the lowest price (in $/MWh) for *energy* produced from scheduled *operating reserve*. If such *registered facility* is instructed to produce *energy* but does not do so as rapidly as instructed, or if the *IESO* needs additional *energy* from *operating reserve* in that area, the *IESO* will call upon the *registered facility* offering the next-lowest price for *energy* from *operating reserve*.

If the *IESO* determines that calling upon *registered facilities* in strict order of increasing price of *energy* means that it will be unable to respond in a timely fashion to a *contingency event*, the *IESO* may call upon *registered facilities* out of such strict order. However, the *IESO* will, as far as is practical, call *registered facilities* in a manner that minimizes the price of *energy* called on.

When *operating reserves* are activated as a result of a *NPCC reportable event*, the otherwise applicable 10-minute *operating reserve* requirements will be reduced by a corresponding amount. The *IESO* will subsequently recover to pre-contingency levels of *operating reserve* requirements

[40] These are 10 minute synchronized, 10 minute non-synchronized, or 30-minute *operating reserve*.

within 105 minutes of the contingency. (Refer to Market Manual 7.6: Glossary of Standard Operating Terms for the definition of *NPCC reportable event*).

For all events that cause the *IESO* to become deficient, the otherwise applicable 10-minute *operating reserve* requirements will be reduced by a corresponding amount. The *IESO* will subsequently recover to pre-contingency levels of *operating reserve* requirements within 90 minutes of the contingency.

7.5 Manual Procurement of Operating Reserve during forced or planned tools outages

Outages of *IESO-administered markets* software, hardware or communication systems may result in temporary disruptions to market activities, such as electronic scheduling and dispatching. During such disruptions, the *IESO* is required to maintain normal market operations to the greatest extent practicable and, if needed, may employ alternative procedures as described in this section (*MR* Ch. 7, Sec. 1.6.3).

Depending on the duration of the *outage* updated *real-time energy* and *operating reserve* schedules may not be available. Furthermore, if *dispatch instructions* for *energy* are issued during the *outage*, the most recent *operating reserve* schedules may not reflect the actual amount of *operating reserve* available, which may be inadequate to meet the *standard authority* requirements (*MR* Ch. 7, Sec. 1.6.1). Under these conditions, the *IESO* will manually procure additional *operating reserve* by calling upon *ancillary service providers* that have made *offers* to deliver *operating reserve* but, as a result of the *outage*, were not *dispatched* for *operating reserve*.

On a reasonable effort basis, the *IESO* will attempt to procure *operating reserve* in amounts that are proportional with each *market participant*'s share in the total available *operating reserve* capacity.

If, as a result of an *outage* of *IESO-administered markets* software, hardware or communication systems, the *IESO* has called upon a *market participant* to provide *operating reserve*, the *IESO* will:

- Notify market participants if the *dispatch instruction* issued in respect of an *operating reserve* by the Dispatch Scheduling & Optimization tool is invalid,
- Indicate the amount of *operating reserve* from each class that is to be provided by that *market participant*,
- Identify whether the request represents an activation of *operating reserve*,
- Indicate, if possible, the duration of the request. If this is not possible, the request will be valid until the *IESO* states otherwise, and
- Indicate any restrictions as to what areas the *operating reserve* needs to be provided from, leaving the *market participant* to choose what resources will be used to meet the request.

When called upon, the *market participant* will (*MR* Ch. 7, Sec. 1.6.4):

- Ensure that, at all times, the amount of *operating reserve* requested by the *IESO* is available for *dispatch*,
- Assess the status of their resources and inform the *IESO* if *operating reserve* cannot be provided as requested, and

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- Immediately report to the *IESO* when their resources *dispatched* for *operating reserve* are reaching the total capacity available for *operating reserve*, within a margin specified by the *IESO*.

Administrative pricing may apply for the manual procurement of *operating reserve* during such market tool failures.

7.6 Compliance with Dispatch Instructions

Every market participant must ensure that each of its registered facilities complies with dispatch instructions issued by the IESO and is subject to all provisions of the *market rules* (*MR* Ch. 7, Sec. 7.5.1). For *variable generation,* compliance with *dispatch instructions* will only apply when the *dispatch instruction* has a mandatory obligation indicator and the *facility* has sufficient fuel (e.g., wind, irradiance) to achieve the *dispatch* target.

Furthermore a *market participant* must notify the *IESO* when it:

- Has been scheduled for 10 minute *operating reserve* and is unable to activate the *operating reserve* within 10 minutes, or
- Has been scheduled for 30 minute *operating reserve* and is unable to activate the *operating reserve* within 30 minutes.

Where a *market participant* expects that, as a result of a *forced outage*, de-rating or any other reason, its *registered facility* will operate in a manner that differs materially from the *IESO's dispatch instructions*, the *market participant* must notify the *IESO* as soon as possible. A difference is material as defined in **Interpretation Bulletin** – "Compliance with Dispatch Instructions Issued to Dispatchable Facilities" (*MR* Ch. 7, Sec. 7.5.2) except for the following:

- In the case of a *registered cogeneration facility* that is either dispatchable or *self-scheduling*, a difference is material if it exceeds:
    - The compliance band as defined in "Compliance with Dispatch Instructions Issued to Dispatchable Facilities" **Interpretation Bulletin**, or
    - The compliance band based on the impact of the production of other forms of useful energy within the facility on *energy* production as determined by the *IESO* during *market entry* (*MR* Ch. 7, Sec. 2.2.6.10), and
- In the case of an *enhanced combined cycle facility* that is either dispatchable or *self-scheduling*, a difference is material if it exceeds:
    - The compliance band as defined in "Compliance with Dispatch Instructions Issued to Dispatchable Facilities" **Interpretation Bulletin** , or
    - The compliance band based on the impact that the recovery of waste heat from an industrial process/processes within the *facility* has on *energy* production as determined by the *IESO* during *market entry* (*MR* Ch. 7, Sec. 2.2.6.10).
- In the case of an *HDR* resource, a difference is material if it exceeds 5 MW of the *demand response capacity* the DRMP expects to be able to deliver.

When a *registered facility* operates in a manner that differs materially from *IESO dispatch instructions market participant* actions may include the following:

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- Notifying the *IESO* (by telephone) of *forced outages* or de-ratings of its equipment and/or making an *outage* submission using the *outage* submission tools (refer to Market Manual 7.1: IESO-Controlled Grid Operating Procedures and Market Manual 7.3: Outage Management, Section 2.2 for more information),
- Submitting revised *dispatch data* to reflect the current capability of the *registered facility* (refer to Market Manual 4.2, Section 2.4 for more information), and
- Rejecting subsequent *dispatch instructions* that the *registered facility* cannot meet. If the *market participant* knows that its *registered facility* will be unable to comply with a *dispatch instruction* at the time that it receives the instruction, it is preferable that the *market participant* reject the instruction within the 60-second timeframe, rather than accepting the *dispatch instructions* and then failing to respond to the instruction.

Dispatch instructions for *energy* or withdrawal reductions that are flagged by the *IESO* as activation of *operating reserve* are accompanied by an "ORA" flag. A departure from these *dispatch instructions* shall be material if:

- In the case of a *dispatchable generation facility*, the facility fails to be at or above the target, and
- In the case of a *dispatchable load facility*, the facility fails to be at or below the target within the timeframe specified by the operating reserve market, for which the registered facility was scheduled.

In other words, if *a dispatchable generation facility* was *scheduled and dispa*tched for 10 minute synchronized or non-synchronized *operating reserve,* the *facility* would have to be at or above the dispatch target 10 minutes after receipt of the *energy dispatch instruction* flagged for activation of *operating reserve*. In the case of a *dispatchable load facility*, scheduled and dispatched for 10 minute synchronized or non-synchronized *operating reserve,* the *facility* would have to be at or below the dispatch target 10 minutes after receipt of the *dispatch instruction* flagged for activation of *operating reserve*.

Compliance with a *dispatch instruction* by a *registered facility* is not required if such compliance would endanger the safety of any person, damage equipment, or violate any *applicable law* (*MR* Ch. 7, Sec. 7.5.3). A *market participant* that departs from *dispatch instructions* for any such reason must notify the *IESO* as soon as possible and provide the following:

- The reason the *registered facility* is unable to follow the *dispatch instruction* issued,
- The duration the *registered facility* is expected to be unable to follow the *dispatch instruction*, and
- The minimum or maximum MW level the *registered facility* can safely operate at.

Accordingly, the *IESO* will *dispatch* the *registered facility* within the "safe" operating level provided.

If the *market participant* fails to accept or reject a *dispatch instruction* (for example, the message timer times-out before the *market participant* responds to the *dispatch instruction*), the *IESO* will respond as though the *market participant* has rejected the *dispatch instruction*. Correspondingly, the *registered facility* output is to remain at its last accepted *dispatch instruction*. In all cases, the *IESO* prefers that the *market participants* respond to *dispatch instructions* by accepting or rejecting the instructions received.

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If failure by a *registered facility*, other than a *boundary entity*, to comply with a *dispatch instruction* endangers *electricity system reliability*, the *IESO* will treat the action through the compliance process and may declare the *registered facility* to be non-conforming. Refer to Market Manual 2.6: Treatment of Compliance Issues for more information on the compliance process.

If a *registered facility*, other than a *boundary entity or HDR* resource, produces or withdraws more or less *energy* in a *dispatch interval* than set out in a valid *dispatch instruction* issued by the *IESO*, the *IESO* will, for pricing and *settlement* purposes:

- Treat the difference in *energy* production or withdrawal as a change in *non-dispatchable load* at its location[41], and
- Use any trade-off curves between *energy* and *operating reserves* in the *dispatch data* for that *registered facility* to determine an appropriate adjustment in the quantity of *operating reserve* of each class supplied by the *registered facility*.

The *IESO* will impose financial penalties on a *market participant* associated with a *boundary entity* who fails to schedule *energy* or *operating reserve* with the appropriate scheduling entity according to the applicable *interchange schedule*, other than for bona fide and legitimate reasons as determined by the *IESO.* Bona fide and legitimate reasons include failures caused by actions and circumstances beyond the control of the *market participant* or due to *IESO* or external scheduling entity error or action.

The *IESO* will impose non-performance charges on a *DRMP* associated with an *HDR* resource who fails to comply with a *dispatch instruction* in the form of an activation notice other than for bona fide and legitimate reasons as determined by the *IESO,* which include failures caused by actions and circumstances beyond the control of the *DRMP*. Bona fide and legitimate reasons include failure of communication infrastructure such that the *DRMP* is unable to modify *HDR bids* or contact the *IESO*.

7.7 Generation Units Turnaround Time

At times, market activity may cause fossil *generation units* to be scheduled on for a period of time, then scheduled off for one or more hours and then scheduled back on again. After they have been dispatched off, due to their slower turnaround time, these units are not capable of ramping-up and providing the scheduled output for the first several hours after being dispatch on. When the *IESO* recognizes this potential pattern in the pre-dispatch, it will conduct a *reliability* impact assessment on these units, considering their turnaround time as well as the system conditions and their status at the time.

Based on this assessment, the *IESO* will determine that:

- The *IESO* cannot dispatch these units off because they are critical for maintaining the *reliability* of the *IESO-controlled grid* in the hours in which they would be unavailable and/or their operation would be restricted following their dispatch off, or

[41] The estimated deviations between scheduled quantities and actual quantities will not be considered in determining the *market schedule* until the start of the 7th calendar month following the *market commencement date*

- The *IESO* can dispatch these units off because units are not critical for maintaining the *reliability* of the *IESO-controlled grid* in the hours in which they are unavailable following their dispatch off.

If the units are critical for maintaining the *reliability* of the *IESO-controlled grid*, the *IESO* will constrain these units on to their minimum output in the hours they would otherwise be scheduled off, such that they are capable of picking up to the level of their offers in the following hours when they are dispatched on.

If the units are not critical for maintaining the *reliability* of the *IESO-controlled grid*, they will be dispatched off. However, when these units are dispatched back on again, *market participants* must submit revised offers to reflect the actual capabilities of the units and the turnaround time involved. When revised dispatch data is submitted within 2 hours of the dispatch hour, the *IESO Short Notice Change Criteria*[42] apply.

– End of Section –

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[42] Refer to Appendix C in Market Manual 4.2: Submission of Dispatch Data in the Real-Time and Operating Reserve Markets

8. Issuing Dispatch Advisories

8.1 Registered Facilities (other than HDR resources and boundary entities)

The *IESO* issues *dispatch* advisories for each *registered facility* that is a *dispatchable load* or *dispatchable generator*, other than a *boundary entity* or *HDR* resource, prior to each *dispatch interval*, indicating for that *dispatch interval*:

- The anticipated *energy* level to be achieved (in MW) by the *facility* at the end of each advisory interval, and
- The anticipated amount of each class of *operating reserve* for each advisory interval.
- The *dispatch* advisories for any *registered facility* will be consistent with the current operating status of that *registered facility*, any operational constraints described in the most recent *dispatch data* submitted by the *registered market participant* for that *registered facility*, and with the *market entry* data maintained by the *IESO*.
- *Market participants* do not have to acknowledge the receipt dispatch advisories. (*MR* Ch. 7 Sec. 7.1.6).

8.2 Boundary Entities and HDR Resources

The *IESO* will not issue *dispatch* advisories to *boundary entities* or *HDR* resources.

8.2.1 Compliance with Dispatch Advisories

There is no obligation for *market participant* to comply with *dispatch* advisories.

– End of Section –

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9. Administrative Pricing

The *IESO* is required to, subject to certain prescribed limitations, establish *administrative prices* and corresponding *market schedules*, where applicable, in the following three situations:

(i) Where the real-time *energy market* and the *operating reserve market* have been suspended,

(ii) Where the *IESO* is unable to publish an *energy market price* or *operating reserve market price* due to a failure or *planned outage* of the software, hardware or the communications systems that supports the operation of the *dispatch algorithm*, or

(iii) Where the *IESO* determines in accordance with Board approved guidelines (Appendix A) relating to price error materiality and acceptable causal events that a *published energy market price* or *operating reserve market price* is incorrect due to incorrect inputs which affected the outcome of the *dispatch algorithm*.

This section only applies to the establishment of *administrative prices* and corresponding *market schedules*, where applicable, in regards to the circumstances described above in (ii) and (iii), it does not apply to (i), the establishment of *administrative prices* and corresponding *market schedules* as a result of *market suspension*. For circumstance (i) above refer to Market Manual 4.5: Market Suspension and Resumption.

In circumstances where *administrative prices* are required, the *IESO* shall establish *administrative prices* and corresponding *market schedules* that would, to the extent practical, reflect the *market prices* and corresponding *market schedules* that would have otherwise been produced by the *real-time markets*, but for the event causing *market prices* to be administered (*MR* Ch. 7, Sec. 8.4A.4).

In establishing *administrative prices* for a non-*market suspension* event and corresponding *market schedules*, where applicable, the *IESO* shall set the *administered price* and *market schedule* for a given *dispatch interval* equal to the price and schedule from either (*MR* Ch. 7, Sec. 8.4A.5):

a) The closest preceding dispatch interval that has not been administered, up to a maximum of 24 dispatch intervals, i.e. “copy forward” from “last good” interval,

b) The closest subsequent dispatch interval that has not been administered, up to a maximum of 24 dispatch intervals, i.e. “copy back” from “next good” interval,

c) A combination of the closest preceding and closest subsequent *dispatch intervals* that have not been administered, provided that neither the preceding nor subsequent *dispatch intervals* are selected for more than 24 dispatch intervals, or

d) When the need to *administer prices* extends beyond 48 *dispatch intervals*, the *IESO* will establish *administrative prices* for the remaining *dispatch intervals* of the event causing *market prices* to be administered within the *IESO control area* and the *intertie zones,* using an average *HOEP* for the *energy market* and the hourly average of the *operating reserve* prices for the applicable *dispatch intervals* for the *operating reserve markets.* The hourly average values will be determined from the corresponding hour or hours from each of the 4 most recent *business days* or non-*business days*, as the case may be, excluding those hours from any day in which *administrative pricing* has been established (*MR* Ch. 7, Sec. 8.4.A.6*)*.

The decision on which interval to use (“preceding” or “subsequent” in (a) or (b) above or the combination of (a) and (b) in (c) above) will be based on the *IESO’s* judgment as to which price would

better meet the guiding principle (i.e. the price that would otherwise have been produced by the market).

Where the *IESO* establishes an *administrative price* for a *dispatch interval* beyond 48 *dispatch intervals*, a *market schedule* is not established and no congestion management *settlement* credit payments made for that *dispatch interval* (*MR* Ch. 7, Sec. 8.4A.7).

The *IESO* will cease to apply *administrative prices* from the commencement of the first *dispatch interval* after:

- The failure to the software, hardware or communications has been rectified, or
- The *planned outage* of the software, hardware or communications has been completed, or
- The incorrect inputs that affected the outcome of the *dispatch algorithm* have been corrected.

The *IESO* will not establish *administrative prices* on the basis of incorrect prices caused by incorrect inputs which affected the outcome of the *dispatch algorithm* if more than 2 *business days* have passed since the *dispatch day* in respect of which the incorrect *energy market price* or *operating reserve market price* was *published*.

To the extent that the *administrative prices* beyond 48 intervals do not adequately compensate a *market participant* for complying with the *IESO's dispatch instructions*, the *IESO* shall provide additional compensation to the *market participant,* subject to materiality limits, as described in *MR* Ch. 7, Sec. 8.4A.9. For the purpose of that section, a request will be considered material and the *market participant* eligible for compensation if the compensation requested is at least:

- $1,000 for a given trade day and registered facility, and
- $200 for a given *trade day* and *registered facility* and the equivalent of $2/MWh.

This compensation shall be calculated as the aggregate of (*MR* Ch. 7, Sec. 8.4A.10*)*:

- The fuel costs or, where applicable, the other costs referred to in *MR* Ch. 7, Sec. 8.4A.11, and the variable operating and maintenance costs incurred by the *market participant* in complying with the *dispatch instructions* issued by the *IESO,* which fuel costs or other costs and variable operating and maintenance costs shall be subject to verification and audit by the *IESO*, and
- Subject to *MR* Ch. 7, Sec. 8.4A.11, an amount equal to 10% of the actual cost as determined above.

Less the amount of the *administrative price* already paid or payable to the *market participant*.

This section does not apply to additional settlement adjustment or compensation issues associated with *administrative prices* established according to *MR* Ch. 7, Sec. 8.4A.5 (i.e., for *market schedules* and prices established by the "copy forward/back" methods). Refer to Market Manual 5.5: Physical Markets Settlement Statements for a description of the associated process where *administrative prices* were applied for 48 intervals or less.

Where the additional compensation referred to above relates to a *generation facility* that is energy limited by design or by bona fide contractual commitments, the *IESO* may accept, in lieu of the actual costs, such assessment of the expected future value or the opportunity costs of the fuel or water consumed:

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- During the period while *administrative prices* were in effect, and
- In order to comply with the *dispatch instruction* issued by the *IESO*,

as the *IESO* considers reasonable.

Where such value or costs are submitted in lieu of the actual costs referred to above, the additional 10% amount above the actual costs shall not be payable if, in the *IESO's* opinion, such value or costs include or adequately cover such amount (*MR* Ch. 7, Sec. 8.4A.11). Refer to Market Manual 5.5 for applying for such compensation.

To request additional compensation, the *market participant* must complete and submit the request application IESO_FORM_1398: Additional Compensation During Administrative Pricing.

Any disputes concerning the additional compensation referred to in above shall be resolved using the dispute resolution process set forth in *MR* Ch. 3, Sec. 2.

– End of Section –

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10. Real-Time Generation Cost Guarantee

The Real-Time Generation Cost Guarantee (RT-GCG) program (also known as Spare Generation Online [SGOL]) offers a guarantee of start-up and minimum generation costs for domestic *generation facilities* that are NOT *quick-start facilities* and that have completed the applicable registration process (Market Manual 1.2: Market Entry, Maintenance and De-registration). Furthermore, these *generation facilities* are guaranteed to be constrained for a specified *minimum generation block run-time (MGBRT)* [43]. During this time the *generation facility* will be constrained on to respect its operational requirements, such as operating at their *minimum loading point (MLP)* for their *MGBRT*.

To be eligible for the generation cost guarantee, *generation facilities* must meet the requirements set out in *MR* Ch. 7, Sec. 2.2B and 5.7. The *generation facility* must be economically scheduled for the dispatch hour in a pre-dispatch schedule that completed within three hours ahead of that *dispatch hour*. If the *market participant* of the *generation facility* wishes to participate in RT-GCG they must notify the *IESO* of their intent to synchronize, and then run at their *MLP* for at least the *MGBRT*. At the time of notification the *market participant* is asked to notify the *IESO* of the time at which they expect to reach their *MLP*. In the event that the *generation facility* will not reach their *MLP* at the estimated time, the *market participant* is asked to contact the *IESO* and adjust their estimate. The *IESO* will accept all requests to participate in RT-GCG, except where their participation will affect reliability, and will review all RT-GCG starts for compliance with the IESO *market rules*.

In addition, they are required to synchronize no earlier than the beginning of the hour before the *dispatch hour* and no later than the end of the *dispatch hour*. Once these *generation facilities* are synchronized, the *IESO* will constrain them on for their *MGBRT* from the time they have estimated that they will reach their *MLP.*

The *IESO* may, for reasons of *reliability*, constrain off a *generation facility* before the end of its *minimum run-time*, in which case the *generation facility* remains eligible for the generation cost guarantee. However, should a *generation facility* fail to run for its *MGBRT* for reasons other than to maintain the *reliability* of the *IESO-controlled grid*, its eligibility for the generation cost guarantee will be forfeited.

If a *market participant* is removing offers within the mandatory window because they cannot meet their operational requirements without a guarantee, they shall communicate this as their reason.

If a *market participant* wishes to use the Replacement Energy Offers program for a unit that has RT-GCG, the replacement unit must meet the schedule of the original unit in order to receive RT-GCG. For example, the replacement unit must synchronize prior to the end of the original unit's dispatch hour, ramp to its *MLP*, and sustain that level for the entire *MGBRT*.

[43] *MGBRT* refers to the number of hours that a *generation facility* must be operating at *minimum loading point* in accordance with the technical requirement of the facility.

10.1 Combined Cycle Facilities

A steam unit is only eligible for the generation cost guarantee to its registered 1x1 *MLP* if the steam unit has met the RT-GCG eligibility requirements prior to any operational constraints being applied. Therefore, when invoking RT-GCG on a steam unit, the *market participant* will indicate to the *IESO* the time that the unit will synch and reach its 1x1 *MLP*. The *IESO* will constrain the steam unit at this value for the unit's *MGBRT*.

If the steam unit's *MLP* is required to be at a higher level than its 1x1 value, the *market participant* should use reasonable efforts to have the unit economically scheduled to the higher level. If the *market participant* is unable to get the appropriate 2x1 or 3x1 *MLP* scheduled, the *market participant* can request the *IESO* to constrain the unit to its operational minimum as submitted by the *market participant*, for the required *MGBRT,* based on the number of combustion turbines synchronized for RT-GCG.

If the *market participant* does not intend to have their steam unit participate in the RT-GCG program, they may still request that it be constrained to its operational minimum at the time they invoke RT-GCG on their combustion turbines. As the operational constraint, in both cases, is due to an equipment concern, the *market participant* is still under the obligation to ensure that its offers are reflective of its operational requirements as per Market Manual 4.2, Appendix C.1 and C.2.

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11. Compliance Aggregation

The Compliance Aggregation program allows *market participants* to aggregate *generation facilities* (that do not qualify for network model aggregation) for purposes of compliance, in order to share individual dispatch instructions among authorized *generation facilities* when system conditions permit. Only the compliance treatment of "aggregated" resources would change. The DSO and operational tools will continue to work as per the *IESO's* market rules.

To be eligible to participate in the Compliance Aggregation program, the generation facilities must complete the applicable registration process (described in Market Manual 1.2: Market Entry, Maintenance and De-registration). In addition, market participants may wish to opt for the meter disaggregation model. The registration process for the meter disaggregation model is described in Market Manual 3 Part 3.7: Totalization Table Registration.

The compliance band for the *generation facilities* accepted for Compliance Aggregation is defined in "Compliance with Dispatch Instructions Issued to Dispatchable Facilities" Interpretation Bulletin.

Under Compliance Aggregation, the generation facilities will continue to receive separate dispatch instructions and will have to comply with individual resource dispatch instructions, when the *IESO* considers it necessary to maintain reliability of the *IESO*-controlled grid. Some examples requiring individual dispatch instructions may include:

- Load rejection and/or generation rejection arming,
- Outages,
- Configuration changes, and
- Security limit violations.

If reliability concerns exist, the *IESO* will communicate instructions to the *market participant* in the following manner:

- The *IESO* Control Room will contact the market participant and specify if the dispatch is on a Unit Specific Dispatch using terminology similar to: "Compliance Aggregation Name" must return to Unit Specific Dispatch. If available, a time frame for return to operation as a compliance aggregate will be provided.
- The *IESO* Control Room will contact the *market participant* when it is possible to return to Compliance Aggregate operation using terminology similar to: "Compliance Aggregate Name" may return to Compliance Aggregate operation at <specify time>.

While operating as a compliance aggregate, *facilities* are required to:

- Follow the normal dispatch process and submit offers for individual resources to reflect the actual, intended operation,
- Respect all obligations regarding synchronized operating reserve requirements within the compliance aggregate, and
- Maintain sufficient units in the compliance aggregate to have their synchronizing breakers closed to meet the amount of synchronized operating reserve scheduled.

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The non-quick start *resources* registered for Compliance Aggregation have the following additional operational requirements in order to operate as a "compliance aggregate" in *real-time*:

- Compliance aggregation may not be used to avoid starting a unit that has been dispatched or to start a unit in place of another that has been dispatched.
- Units within a compliance aggregate are to operate within 50 MW of their individual dispatch instructions unless:
  - Offered ramp up and ramp down rates are the same, or within 1 MW/min for the same MW range, and
  - All offered ramp rates above minimum loading points do not vary by more than 1 MW/min. on each unit in the compliance aggregate.

Operation as a "compliance aggregate" is only permitted where all resources are operating above the *minimum loading point.*

Generation Facilities eligible for compliance aggregation who also provide *regulation* may be subject to additional restrictions.

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Appendix A: Administrative Guidelines

This appendix provides the amendments to guidelines approved by the *IESO Board* on June 10, 2004 for events other than resulting from *market suspension*. The Illustrations have been added to provide clarity.

A.1 Acceptable Causal Events

A.1.1 Attempt to identify dispatch intervals, during which there have been:

- Operational telemetering failures, which have resulted in the loss or corruption of inputs to the *market schedule*,
- *IESO Administered Markets'* software failures, which have resulted in the loss or corruption of inputs to the *market schedule*, or
- *IESO* business process failures, which have resulted in the loss or corruption of inputs to the *market schedule*.

A.1.2 For intervals in which the loss or corruption of inputs has occurred, replace the prices and market schedules for those intervals with:

a. The last good interval's prices and *market schedules* for up to 24 intervals (Figure A-1),

b. The next good interval's prices and *market schedules* for up to 24 intervals (Figure A-2), or

c. A combination of the last good interval's and the next good interval's prices and *market schedules* for up to an aggregate of 48 intervals provided that neither the last good interval's nor the next good interval's prices or *market schedules* shall be used for more than 24 intervals (Figure A-3),

unless the *IESO* is able to reasonably determine that the corrupt price for those intervals is closer to what the prices likely would have been had there been correct inputs, in which case the *IESO* shall deem the prices as correct (and shall therefore not be required to *administer prices*).

When such loss or corruption of inputs continues for more than 48 intervals, the prices will be established using *HOEP* for *energy* prices and the hourly averages for the applicable *operating reserve* prices from the corresponding hour or hours from each of the 4 most recent *business days* or *non-business*, as the case may be, excluding those hours from any day in which *administrative pricing* has been established, unless the *IESO* is able to reasonably determine that the corrupt price for these ensuing intervals is closer to what the prices likely would have been had there been correct inputs, in which case the *IESO* shall deem the prices as correct (and shall therefore not be required to *administer prices*) (Figure A-3).

In determining which of the alternatives to use from section 2, the *IESO* shall be guided by the principle that *administrative prices* and *market schedules* should be established, to the extent

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practical, to reflect the *market prices* and corresponding *market schedules* that would otherwise have been produced by the real-time markets but for the event causing *market prices* to be administered.

At the April 5, 2002 meeting of the *IESO* Board, *IESO* Management put forward certain screens that would be used for purposes of investigation. *IESO* Management has the discretion to change these screens and to administer prices even if one of these screens has not been triggered.

A.1.3 Copy Forward Illustration:

Assume that as a result of incorrect inputs to the dispatch scheduling & optimization (DSO) algorithm administrative prices are required for 24 intervals starting with *dispatch interval* 1 of HE 16 (see Figure A-1 below).

The *IESO* determines that the last *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is interval 12 of HE 15, identified as interval A. The next *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is determined to be interval 1 of HE 18.

Assessing the market conditions at the time, the *IESO* determines that the *energy* and *operating reserve* prices calculated for interval A reflect, to the extent practical, the *energy* and *operating reserve* prices that would otherwise have been produced by the market for intervals 1-24. Consequently, under the provisions of *MR* Ch. 7, Sec. 8.4A.5.1, the *IESO* will replace the *energy* and *operating reserve* prices calculated incorrectly by the DSO for intervals 1-24 with the *energy* and *operating reserve* prices calculated for interval A. In doing so, the *IESO* will replace the 4 Ontario prices (*energy*, 10S, 10NS and 30) and all 39 *intertie* prices (*energy*, 10NS, 30 for all 13 *intertie zones*) for intervals 1-24 with the corresponding *energy* and *operating reserve prices* calculated for interval A.

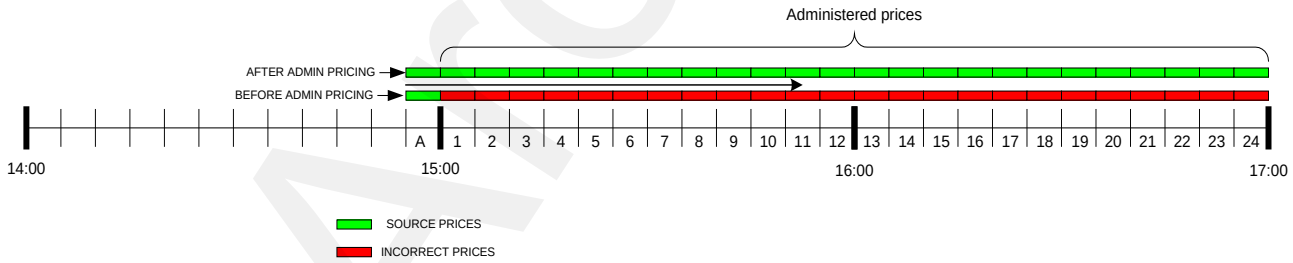


Figure A-1: Copy Forward Scenario

A.1.4 Copy Backward Illustration:

In this example, *administrative prices* are needed for 4 intervals starting with interval 1 of HE 9 (see Figure A-2 below).

The *IESO* determines that the last *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is interval 12 of HE 8. The next *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is determined to be interval 5 of HE 9, identified as interval B.

Assessing the market conditions at the time, the *IESO* determines that the *energy* and *operating reserve* prices calculated for interval B reflect, to the extent practical, the prices that would otherwise have been produced by the market for intervals 1-4. Consequently, under the provisions of *MR* Ch. 7, Sec. 8.4A.5.2, the *IESO* will replace the *energy* and *operating reserve prices* calculated incorrectly by the DSO for intervals 1-4 with the *energy* and *operating reserve* prices calculated for interval B. In doing so, the *IESO* will replace the 4 Ontario prices (*energy*, 10S, 10NS and 30) and all 39 *intertie* prices (*energy*, 10NS, 30 for all 13 *intertie zones*) for intervals 1-4 with the corresponding *energy* and *operating reserve* prices calculated for interval B.

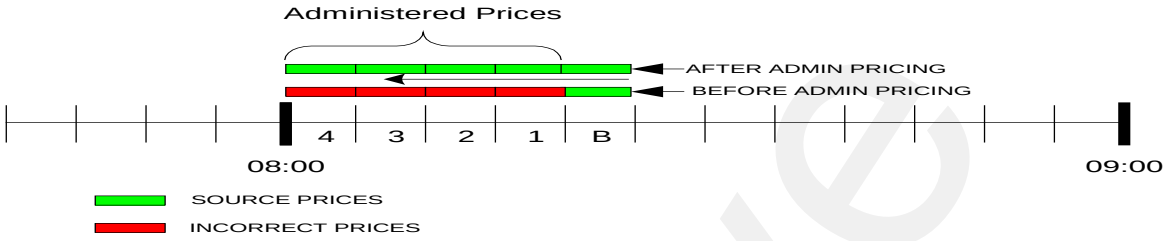


Figure A-2: Copy Backward Scenario

A.1.5 Copy Forward and Backward Illustration

Assume that *administrative prices* are needed for 55 intervals starting with interval 10 of HE 17 (see Figure A-3 below).

The *IESO* determines that the last *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is interval 9 of HE 17, identified as interval A. The next *dispatch interval* for which *energy* and *operating reserve* prices were correctly calculated is determined to be interval 5 of HE 22, identified as interval B.

Assessing the market conditions at the time, the *IESO* determines that:

- The *energy* and *operating reserve* prices calculated for interval A reflect, to the extent practical, the price that would otherwise have been produced by the market for intervals A1-A24, and
- The *energy* and *operating reserve* prices calculated for interval B reflect, to the extent practical, the price that would otherwise have been produced by the market for intervals B1-B24.

Consequently, under the provisions of *MR* Ch. 7, Sec. 8.4A.5.3, the *IESO* will replace:

- The *energy* and *operating reserve* prices calculated incorrectly by the DSO for intervals A1-A24 with the energy and *operating reserve* prices calculated for interval A, and
- The *energy* and *operating reserve* prices calculated incorrectly by the DSO for intervals B1-B24 with the *energy* and *operating reserve* prices calculated for interval B.

Since *administrative prices* are required for more than 48 intervals, the *IESO* will, under the provisions of *MR* Ch. 7, Sec. 8.4A.6, use average *HOEP* and average *operating reserve* prices to replace the *energy* and *operating reserve* prices incorrectly calculated by the DSO for intervals 10 to 12 of HE 19 and intervals to 1 to 4 of HE 20.

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The average *HOEP* is determined from the corresponding hour from each of the 4 most recent business days or non-business days, as the case may be, excluding those hours from any day in which *administrative pricing* has been established under *MR* Ch. 7, Sec. 8.4A.6. The average *operating reserve* price is determined as the hourly average from the corresponding hour from each of the 4 most recent business days or non-business days, as the case may be, excluding those hours from any day in which *administrative pricing* has been established under *MR* Ch. 7, Sec. 8.4A.6.

The *IESO* will replace the 4 Ontario prices (*energy*, 10S, 10NS and 30) and all 39 *intertie* prices (energy, 10NS, 30 for all 13 *intertie zones*).

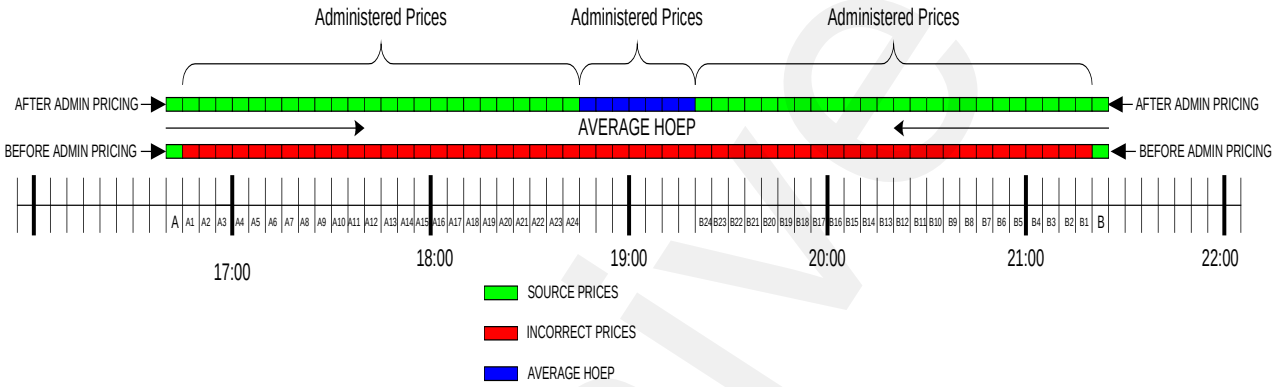


Figure A-3: Copy Forward and Backward Scenario

– End of Section –

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References

Document ID	Document Title
MDP_RUL_0002	Market Rules for the Ontario Electricity Market
MDP_PRO_0014	Market Manual 1.1: Participant Authorization, Maintenance and Exit
MDP_PRO_0016	Market Manual 1.2: Facility Registration, Maintenance, and De-registration
MDP_PRO_0022	Market Manual 2.6: Treatment of Compliance Issues
IMP_PRO_0047	Market Manual 3.7: Totalization Table Registration
MDP_PRO_0030	Market Manual 4.5: Market Suspension and Resumption
MDP_PRO_0033	Market Manual 5.5: Physical Markets Settlement Statements
IMO_MAN_0024	Market Manual 6: Participant Technical Reference Manual
MDP_PRO_0040	Market Manual 7.1: IESO-Controlled Grid Operating Procedures
IMP_PRO_0033	Market Manual 7.2: Near Term Assessments and Reports
IMP_PRO_0035	Market Manual 7.3: Outage Management

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