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# Market Renewal Program: Energy

## MARKET POWER MITIGATION Detailed Design

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Issue 1.0.

*This document provides a detailed overview of the processes related to Market Power Mitigation that will be implemented for the Energy work stream of the Market Renewal Program, including related market rules and procedural requirements.*

***Disclaimer***

This document provides an overview of the proposed detailed design for the Ontario Market Renewal Program (MRP) and must be read in the context of the related MRP detailed design documents. As such, the narratives included in this document are subject to on-going revision. The posting of this design document is made exclusively for the convenience of *market participants* and other interested parties.

The information contained in this design document and related detailed design documents shall not be relied upon as a basis for any commitment, expectation, interpretation and/or design decision made by any *market participant* or other interested party.

The *market rules*, *market manuals*, applicable laws, and other related documents will govern the future market.

## Document Change History

Issue	Reason for Issue	Date
1.0	First publication for external stakeholder review.	May 5, 2020

## Related Documents

Document ID	Document Title
DES-13	MRP High-level Design: Single Schedule Market
DES-14	MRP High-level Design: Day-Ahead Market
DES-15	MRP High-level Design: Enhanced Real-Time Unit Commitment
DES-16	MRP Detailed Design: Overview
DES-17	MRP Detailed Design: Authorization and Participation
DES-18	MRP Detailed Design: Prudential Security
DES-19	MRP Detailed Design: Facility Registration
DES-20	MRP Detailed Design: Revenue Meter Registration
DES-21	MRP Detailed Design: Offers, Bids, and Data Inputs
DES-22	MRP Detailed Design: Grid and Market Operations Integration
DES-23	MRP Detailed Design: Day-Ahead Market Calculation Engine
DES-24	MRP Detailed Design: Pre-Dispatch Calculation Engine
DES-25	MRP Detailed Design: Real-Time Calculation Engine
DES-26	MRP Detailed Design: Market Power Mitigation
DES-27	MRP Detailed Design: Publishing and Reporting Market Information
DES-28	MRP Detailed Design: Market Settlement
DES-29	MRP Detailed Design: Market Billing and Funds Administration



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# Table of Changes

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<b>Reference (Section and Paragraph)</b>	<b>Description of Change</b>

# 1 Introduction

## 1.1 Purpose

This document is a section of the Market Renewal Program (MRP) detailed design document series specific to the Energy work stream. This document provides the details of the business design and the requirements for *market rules*, market facing and internal procedures, and the data flow required to support the Market Power Mitigation process as related to the introduction of the future day-ahead market and *real-time market*. This design document will aid the development of user requirements, business processes, *market rules* and supporting systems.

As illustrated in Figure 1-1, this document is part of the MRP detailed design document series and will provide the design basis for the development of the governing documents and the design documents.

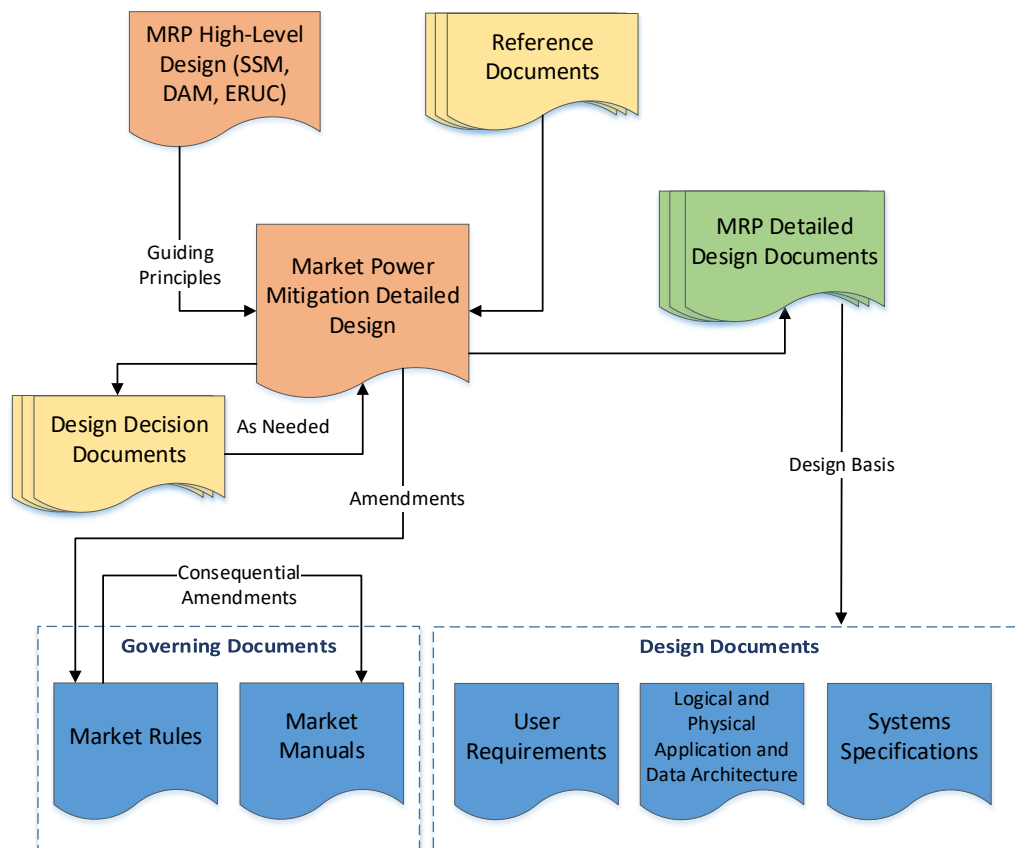


Figure 1-1 Detailed Design Document Relationships

## 1.2 Scope

This document describes the Market Power Mitigation process requirements for the future day-ahead market and *real-time market*, in terms of:

- detailed functional design;

- supporting *market rules* requirements;
- supporting procedural requirements; and
- business process and information flow requirements.

Various portions of this document make reference to current business practices, rules, procedures and processes of Market Power Mitigation. However, this document is not a restatement of the existing design of the *Independent Electricity System Operator (IESO)* process. Rather, this document focuses on existing components only to the extent that they might be used in the current or amended form in support of the future day-ahead market and *real-time market*.

## 1.3 Who Should Use This Document

This document is a public document for use by the MRP project team, pertinent *IESO* departments and external stakeholders. Portions of this document that are only pertinent to *IESO* internal processes and procedures may not be incorporated into the public version.

## 1.4 Assumptions and Limitations

### Assumptions:

While this document provides values for specific parameters that might be used in the Market Power Mitigation process, the final value of such parameters will be determined through the development of the market rules and market manuals.

### Limitations:

The business process design presented in Sections 2 and 6 of this document provides a logical breakdown of the various sub-processes described in the detailed business design presented in Section 3. However, factors such as existing and future system boundaries and system capabilities may alter the ultimate design of these sub-processes.

## 1.5 Conventions

The standard conventions followed for this document are as follows:

- Title case is used to highlight process or component names; and
- Italics are used to highlight *market rule* terms that are defined in Chapter 11 of the *market rules*.

## 1.6 Roles and Responsibilities

This document does not set any specific roles or responsibilities. This document provides the design basis for development of the documentation associated with the *IESO* Project Lifecycle that will be produced in conjunction with the MRP.

## 1.7 How This Document Is Organized

This document contains the following sections:

- **Section 2** of this document briefly describes the *IESO's* current local market power framework and the Market Power Mitigation framework for the future day-ahead market and *real-time market*;
- **Section 3** provides a detailed description of the functional design inferred from sections relevant to the Market Power Mitigation framework in the high-level designs for Single



- Schedule Market (SSM), Day-Ahead Market (DAM) and Enhanced Real-time Unit Commitment (ERUC);
- **Section 4** of this document describes how the Market Power Mitigation process will be enabled under the authority of the *market rules* in terms of existing rule provisions, amended rule provisions and additional rule provisions that will need to be developed;
  - **Section 5** of this document describes how the requirements of the Market Power Mitigation process are expected to impact the market-facing manuals and internal procedures in terms of existing procedures, amended procedures and additional procedures that will need to be developed; and
  - **Section 6** of this document provides an overview of the arrangement of *IESO* processes supporting the overall Market Power Mitigation process described in Section 3. This section also outlines the logical boundaries and interfaces of the various sub-processes related to the Market Power Mitigation process in terms of existing processes, amended processes and additional processes that will need to be developed.

– End of Section –

## 2 Summary of Current and Future State

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A market thrives when there is open and fair competition among participants. However, the physical constraints of the transmission system and the need to maintain system *reliability* may, on occasion, provide a *market participant* the ability to exercise market power by either economically or physically withholding supply from the market. Economic withholding occurs when a portion of, or all, available supply is offered at prices significantly higher than their short-run marginal costs and those higher offers raise prices as a result. Physical withholding occurs when a portion of, or all, available capacity is not offered into the market and prices are higher as a result.

### 2.1 Market Power Mitigation in Today's Market

Mitigation for economic withholding is performed in the current *real-time market*. An explicit framework for the mitigation of physical withholding does not exist in the current *IESO-administered markets*.

#### 2.1.1 Ex-Post Mitigation for Economic Withholding

Currently, market power mitigation for economic withholding in the *IESO-administered markets* is performed ex-post (after-the-fact) through the local market power framework. The mitigation takes the form of *settlement* adjustments of out-of-market make-whole payments. The ex-post process allows the *IESO* to determine costs actually incurred for the period in which market power is being reviewed.

##### 2.1.1.1 Applicability

Circumstances arise on the *IESO-controlled grid* in which a transmission constraint or *security limit* necessitates the constrained *dispatch* of a resource. The local nature of the transmission constraint, coupled with a lack of resources competing to provide the required physical service, can give rise to conditions of local market power. In such cases, *market participants* may receive excessive Congestion Management Settlement Credit (CMSC) payments.

The *market rules* provide the *IESO* with the authority to recalculate excessive CMSC payments resulting from instances of local market power or related conditions. This adjustment of CMSC is intended to return to the profit level the *market participant* would have earned had their resource not been constrained.

In determining whether or not local market power existed at a given time for a given resource, the *IESO* conducts three screens. Detailed information on these screens is available in Section 1.3 of Appendix 7.6 of the *market rules* and Appendix B and C of Market Manual 2.12.

Generally, these screens are designed to answer the following questions:

- Can the constrained *dispatch* at the investigated *facility* be causally linked to a transmission constraint or security limit?
- Are there insufficient resources competing to provide the required physical service in the local area?
- Is the investigated *offer/bid* price inconsistent with the resource's historical pricing behaviour or the relevant prevailing *market price*?

A price investigation process determines whether the *investigated price* is consistent with the resource's underlying marginal cost or benefit, depending on the resource type. For *energy* limited resources,

opportunity costs are also considered.

During the price investigation process, *market participants* have the opportunity to make representations regarding CMSC recalculations, or to propose an alternate *settlement* price. If the *IESO* believes the *investigated price* or alternate price proposed by a *market participant* is inconsistent with the participant's underlying marginal cost or benefit, the *IESO* has the authority to recalculate CMSC.

Constrained-off events that occur in a designated Constrained-off Watch Zone (COWZ) are subject to review under the COWZ framework. While similar in objective to the local market power process, COWZ does not require the *IESO* to establish the existence of local market power in reference to the three investigations described earlier.

A zone is designated as a COWZ when nodal prices in the area diverge regularly from the market clearing price. Such conditions give rise to frequent constrained-off *dispatches* and provide participants with the opportunity to receive excessive CMSC payments. To mitigate such payments, the *IESO* developed COWZ, wherein resources found to receive persistent and significant constrained-off CMSC (as defined by the thresholds in Market Manual 2.12) may be subject to a CMSC recalculation. Similar to the CMSC recalculation under local market power, the *IESO* will recalculate CMSC under COWZ if it believes the investigated *offer/bid* price is inconsistent with the resource's underlying cost or benefit.

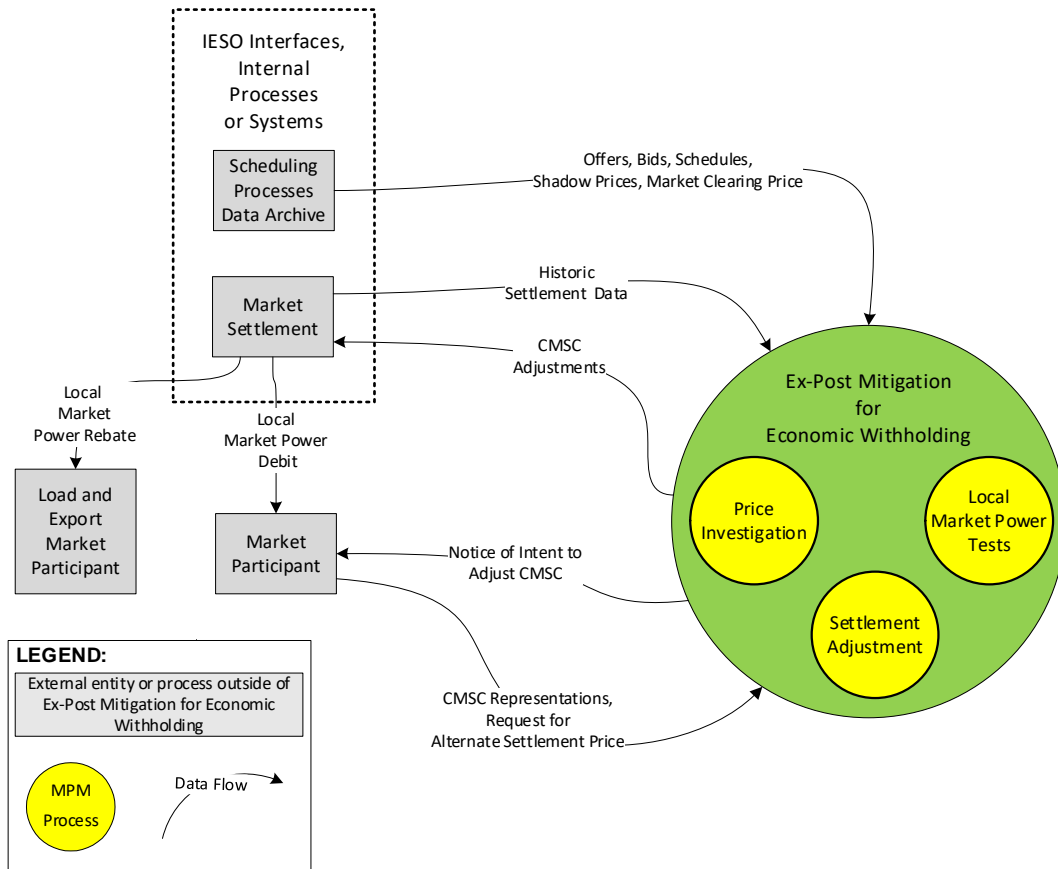
The only zone currently designated as a Constrained-off Watch Zone is the Northwest (for injections only, which means generators and imports).

The *interties* currently designated as Uncontested Export Interties are the Kipiwa and Outaouais *interties*.

Settlement adjustments resulting from local market power investigations are distributed back to *market participants*. They are distributed on a pro-rata basis based on their energy withdrawal.

The current local market power process will continue to be performed until the two-schedule *energy market* system with constrained and unconstrained schedules is no longer utilized.

Figure 2-1 provides a high-level overview of the current state of Market Power Mitigation process.



**Figure 2-1: Current State of Market Power Mitigation**

## 2.2 Market Power Mitigation in the Future Market

In a single schedule market for *energy* and *operating reserve*, schedules and locational marginal prices (LMPs) are impacted by the *offer* prices and other *dispatch data* submitted by *market participants*. In the future market, the ex-ante approach to market power mitigation will be applied where possible in the day-ahead, pre-dispatch and real-time scheduling processes. This will address situations where market power can affect *dispatch schedules* and prices in the *energy* and *operating reserve markets*. The *settlement* mitigation process will address situations where market power can impact the *settlement* of make-whole payments.

In the future single schedule market, ex-post mitigation of market power will be used to alleviate the effects of physical withholding. Physical withholding refers to the exercise of market power when one or more *market participants* refrain from supplying *energy* or *operating reserve* that was otherwise available in the day-ahead and real-time markets. The ex-post approach to market power mitigation will also be used to alleviate the effects of economic withholding on uncompetitive *interties*.

The *IESO's* review for market power mitigation, including testing and any related step taken by the *IESO*, will not constitute a review for compliance with any *market rule*, including Chapter 1, Section 10A – General Conduct or Section 11 – Information Disclosure.

The framework for market power mitigation in the future day-ahead market and real-time market will consist of the following.

- Ex-ante validation of non-financial *dispatch data*;
- Ex-ante mitigation for economic withholding affecting *energy* and *operating reserve* prices;
- *Settlement* mitigation of make-whole payments;
- Ex-post mitigation for physical withholding affecting *energy* and *operating reserve* prices; and
- Ex-post mitigation for economic withholding affecting prices or make-whole payments on uncompetitive *interties*.

### 2.2.1 Conduct and Impact Tests

The new mitigation framework will include conduct and impact tests that will only be carried out under conditions corresponding to when and where competition is restricted.

The conduct threshold is the allowance that is used to determine whether the *dispatch data* values offered by a resource deviate significantly from what the values would have been in a competitive market. Conduct thresholds applied in the conduct test vary according to the extent to which competition is restricted. As competition is more restricted, conduct thresholds become narrower.

The conduct test will determine if select financial *dispatch data* values submitted by a *market participant* for a resource differ from *IESO*-determined and registered reference levels by more than the relevant conduct threshold. If one or more *dispatch data* value for any resource fails the conduct test, the impact test will be conducted. If all *dispatch data* parameters specific to a resource pass the conduct test, no mitigation will be applied to that resource.

As-offered results include the prices and schedules that are determined using *dispatch data* values submitted by *market participants*. Reference level results include the prices and schedules that would have occurred had each *dispatch data* value that failed the conduct test been substituted by its respective reference level. The impact test compares the as-offered results to the reference level results. The impact

test is failed if the prices in the as-offered results are greater than those in the reference level results by a specified impact threshold.

The impact threshold is the allowance that is used to determine whether prices in the as-offered results are significantly higher than prices in the reference level results. The impact threshold varies according to the extent to which competition is restricted. As competition is more restricted, impact thresholds become narrower.

If the impact test is failed, each *dispatch data* value that failed the conduct test is substituted with the applicable reference level values. Prices are then determined using the substituted reference levels in place of the as-offered *dispatch data* values.

## 2.2.2 Constrained Areas

The initiation of conduct and impact tests is based on the specific conditions corresponding to the constrained area to which a resource belongs. When an area is constrained from being supplied by additional resources, competition is reduced and this creates the potential for the exercise of market power. The constrained area to which a resource belongs is a reflection of the extent to which competition is restricted for that resource. The *IESO* will apply conduct tests using conduct thresholds specific to the constrained area that meets the conditions.

The constrained area types considered for each impact assessment are identified as follows:

- Constrained area types for *energy* include:
  - Local market power in Narrow Constrained Areas (NCA);
  - Local market power in Dynamic Constrained Areas (DCA);
  - Local market power in Broad Constrained Areas (BCA);
  - Global market power – Province-wide market power; and
  - *Reliability* constraints – System operator actions.
- Constrained area types for *operating reserve* include:
  - Local market power – Reserve area limited *operating reserve* supply; and
  - Global market power – Province-wide limited *operating reserve* supply

### 2.2.2.1 Designation of Constrained Areas

#### NCA Constrained Area Designation

Narrow Constrained Areas (NCAs) are areas where congestion is expected to be relatively frequent over a long duration. The *IESO* will assess NCA designations on an annual basis. This assessment may result in the determination of a new NCA, the persistence of an existing NCA, or the revocation of an NCA designation.

#### DCA Constrained Area Designation

Dynamic Constrained Areas (DCAs) will be designated when congestion is expected to be relatively frequent but not for a long enough duration to warrant the designation of an NCA. An example of such a condition might be a transmission *outage* that results in, or is expected to result in, increased congestion leading into a load pocket for a period of days. In such cases, these load pockets will be designated as a DCA for the duration of these conditions. Refer to the Section 3.3 to view the definition of load pockets.

## BCA Constrained Areas

Broad Constrained Areas (BCA) are areas where transmission constraints that are not NCA or DCA constraints result in supply resources being dispatched up. Transmission constraints that create load pockets that bind relatively infrequently make up the BCA.

## Global Market Power – Energy

Global market power conditions assess whether competition is restricted due to reasons other than local transmission constraints and if the preconditions for the exercise of global market power exist. These conditions are based on global constraints that potentially restrict competition across the market as a whole.

## Reliability Constraints

*Reliability* constraints are specific situations where the *IESO* system operator needs to manually commit or set the schedule for a resource to maintain *reliability* of the *IESO-controlled grid*.

## Local Market Power – Operating Reserve

Local market power for *operating reserve* are situations when the *IESO* sets *operating reserve* requirements for specific localized regions in Ontario so that no less than some positive amount of *operating reserve* must be scheduled.

## Global Market Power – Operating Reserve

Global market power for *operating reserve* are situations when *market participants* have market power across Ontario for *operating reserves*.

### 2.2.3 Ex-Ante Validation of Non-Financial Dispatch Data

To mitigate the exercise of market power, the *IESO* will validate the non-financial *dispatch data* for a resource at the time of submission. The non-financial *dispatch data* will be validated against reference levels and predefined conduct thresholds. Reference levels are *IESO*-determined estimates of what would have been offered by a *market participant* had they been subject to unrestricted competition. Conduct thresholds are allowable tolerances outside of the established reference levels. If the submitted non-financial *dispatch data* value of any one of the non-financial *dispatch data* is outside the acceptable range determined by the reference level plus the conduct threshold, that non-financial *dispatch data* will be rejected. Testing of non-financial *dispatch data* will not include a price impact test.

### 2.2.4 Ex-Ante Mitigation for Economic Withholding

To mitigate the impact of economic withholding, the *IESO* will perform ex-ante conduct and impact tests. This methodology determines whether *dispatch data* submitted by *market participants* (e.g. *energy offers*, *operating reserve offers*, start-up offers, and speed no-load offers) deviate from what would be expected under competitive pressures, and if those *dispatch data* values raised prices as a result. Under this methodology, mitigation of the relevant *dispatch data* values will only occur if prices are affected.

When market power has been exercised, and *energy* or *operating reserve* prices have been affected, any *dispatch data* value that differs from its relevant ‘reference level’ by a defined amount is substituted with the corresponding reference levels. This is referred to as mitigation of the *dispatch data*. Reference levels represent a pre-established estimate of what would have been *offered* by a *market participant* had they been subject to unrestricted competition. This ex-ante mitigation process will be a part of the determination of outcomes in the *IESO*’s day-ahead, pre-dispatch and real-time calculation engines.

## Ex-Ante Mitigation – Applicability

In general, resources that act as suppliers of a product will be tested for market power in the supply of that product. For example, generation resources are suppliers of *energy* and thus will be tested for market power in the *energy market*.

Generation resources and *dispatchable loads* are suppliers of *operating reserve* and thus will be tested for market power in the *operating reserve* markets.

Typically, *dispatchable loads* and *hourly demand response* resources pay the *energy* price to consume *energy* and thus have little incentive to exercise market power in the *energy market*. However, in the event that these demand-side *market participants* receive payments for reducing or avoiding consumption, this design should be amended so that they are tested for market power similar to other suppliers of *energy*.

## Reference Levels

Reference levels are *IESO*-determined estimates of the *dispatch data* parameters that a resource would have submitted if it were operating under competitive conditions. *Market participants* will be able to view their applicable reference levels on a confidential basis.

The *IESO* will determine reference levels for financial *dispatch data* parameters that describe characteristics expressed in monetary terms. Examples of financial *dispatch data* parameters include *energy offer* (\$/MWh), speed no-load offers (\$/hour) and start-up offers (\$/start). Reference levels for financial *dispatch data* parameters will be established in consultation with *market participants* using a cost-based methodology. These reference levels will be based on short-run marginal costs and may include costs relating to fuel (including the gross revenue charge for hydroelectric resources), operating and maintenance costs and opportunity costs, where applicable.

The *IESO* will also set reference levels for non-financial *dispatch data* parameters that express the operating characteristics of a resource. Examples of non-financial *dispatch data* parameters include *minimum loading point*, *minimum generation block down time* and *energy ramp rates*. Reference levels for non-financial *dispatch data* parameters will also be established in consultation with *market participants*.

There may be extenuating circumstances where the *market participant* believes that the financial reference level that was used to determine their *settlement* outcomes was inappropriate. To address such circumstances, the *IESO* will implement a *settlement* cost recovery process to reconcile the reference level used for mitigation and the fuel that the *market participant* considers, and the *IESO* agrees are, more appropriate.

## 2.2.5 Settlement Mitigation of Make-Whole Payments

To mitigate the impact of economic withholding, the *IESO* will also perform make-whole payment impact tests as part of the *settlement* process using the conduct and impact testing methodology. There are a number of payments that comprise make-whole payments. The detailed descriptions and calculation of the various *settlement* make-whole payments that will be subject to mitigation are provided in the Market Settlement detailed design document.

For any resource that fails both ex-ante conduct and price impact tests, relevant *dispatch data* values will be substituted with their applicable reference level values as part of the mitigation process.

For any resource that fails the ex-ante conduct tests but passes the ex-ante price impact tests, the ex-ante conduct test results will be used by the *settlement process* to determine the impact to make-whole payments.



Any resource that was not subject to ex-ante conduct testing for a price impact, but nonetheless meets the conditions to test for make-whole payment impact, will be subject to conduct and impact tests for make-whole payment impacts.

The *settlement process* will be provided with all relevant inputs including reference levels that were used by or were available to the calculation engine. The settlement impact test will compare the make-whole payments that were determined using the *dispatch data* used by the calculation engines to form schedules and prices to the make-whole payments that would have occurred based on the reference level results. The impact test is failed if the make-whole payments using the *dispatch data* used by the calculation engines to form schedules and prices are greater than those based on the reference level results by a specified make-whole payment impact threshold.

Market power is considered to be exercised only if make-whole payments fail the make-whole payment impact test. In such instances, the *IESO* will substitute the relevant *dispatch data* values that differ from the relevant reference levels by a defined amount with the corresponding reference levels to determine the make-whole payments.

## 2.2.6 Ex-Post Mitigation for Physical Withholding

Physical withholding can affect system *reliability* as the act of reducing supply can, in the extreme, lead to demand that cannot be met. Unlike economic withholding, the mitigation of physical withholding can only occur ex-post because the *IESO* cannot *dispatch* supply that was not *offered*.

The *IESO* will use an ex-post process to identify instances of potential physical withholding in the *energy* and *operating reserve* markets. Ex-post mitigation are actions that will be taken by the *IESO* after the determination of *dispatch* schedules and prices and the final settlement of the *energy* and *operating reserve* markets.

The ex-post mitigation process will involve conduct and impact tests for the mitigation of physical withholding. The conduct test will determine if *offered* quantities were significantly lower than what would have been *offered* under competitive conditions. The impact test will determine if prices would have been significantly lower had the withheld quantities been *offered* into the market. If both the conduct and impact tests are failed, the *IESO* will notify *market participants* on the initial findings of the tests.

When tests for market power for physical withholding are failed, the *IESO* will issue a *settlement* charge. *Market participants* will have an opportunity to make representations regarding the reference quantity used in the initial conduct and impact tests before the *IESO* issues any *settlement* charge.

### Reference Quantity

To carry out the conduct and impact test for physical withholding for each resource, the *IESO* will determine an estimate of the quantity that would have been *offered* under competitive conditions, which is known as the reference quantity.

The methodology to determine the reference quantity for *energy* will be consistent with that used in the Reliability Outlook to assess resource contributions to *reliability*. These reference quantities can be modified by active outages, de-ratings, external factors such as ambient temperature, humidity, water flow conditions and other resource specific considerations.

As described in Section 3, *market participants* will have opportunities to provide input to the *IESO* regarding the estimates of the reference quantity prior to the issuance of any *settlement* charge. This input will be considered by the *IESO* and will, where appropriate, modify the reference quantity used in the determination of any *settlement* charge.

## 2.2.7 Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties

Unlike economic withholding for non-*intertie* resources, the mitigation of economic withholding on uncompetitive *interties* can only occur ex-post due to the timing associated with determining short run marginal costs of *intertie* transactions.

The *IESO* will use an ex-post mitigation process that involves conduct and impact tests to identify instances of potential economic withholding on uncompetitive *interties* in the *energy* and *operating reserve* markets.

The conduct test will determine if *offers* for *energy bids* for *energy*, or *offers* for *operating reserve* were submitted at prices significantly higher than *intertie* reference levels. The impact test will determine if prices or make-whole payments were greater by a specified threshold than those that would have occurred if the *intertie* reference levels were submitted. If both the conduct and impact tests are failed, the *IESO* will notify *market participants* on the initial findings of the tests.

When tests for market power for economic withholding on uncompetitive *interties* are failed, the *IESO* will issue a *settlement* charge. *Market participants* will have an opportunity to make representations regarding the *intertie* reference level used in the initial conduct and impact tests before the *IESO* issues any *settlement* charge.

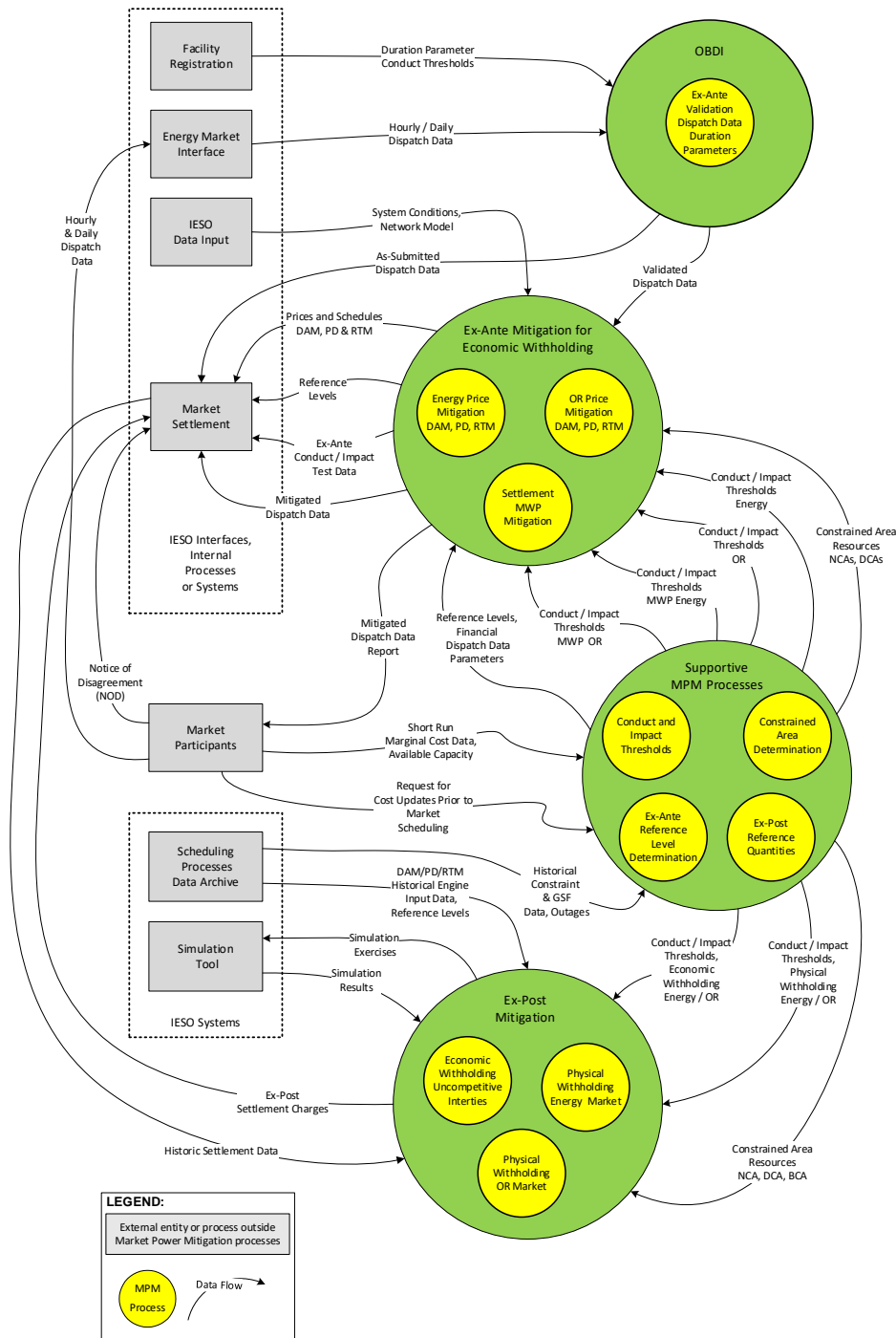
## 2.2.8 Reporting on Mitigation

The *IESO* will report on mitigation by publishing public and confidential reports. For example, the *IESO* will communicate anonymous summary data publicly and will inform *market participants* on a confidential basis when their resources fail the conduct and impact tests.

The *IESO* will confidentially notify *market participants* if their *dispatch data* values were mitigated and will also inform them on the reference levels that were used.

Reporting on mitigation is described in further detail in Section 3.16 and the Publishing and Reporting Market Information detailed design document.

Figure 2-2 provides a high-level overview of the future state mitigation of market power activities and processes.



**Figure 2-2: Future State of Market Power Mitigation**

– End of Section –

## 3 Detailed Functional Design

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### 3.1 Structure of this Section

This section is sub-divided into the major topic areas that are relevant to the Market Power Mitigation process. Over the course of this section, the design of the Market Power Mitigation process will be discussed in terms of:

- Objectives;
- Terminology;
- Overview of the Market Power Mitigation Framework:
  - The Mitigation Process;
  - Conditions to Test for Mitigation for Price Impact; and
  - Conditions to Test for Mitigation for Make-Whole Payment Impact.
- Ex-Ante Validation of Non-Financial Dispatch Data;
- Ex-Ante Mitigation for Economic Withholding:
  - Ex-Ante Mitigation for Energy Price Impact; and
  - Ex-Ante Mitigation of Operating Reserve Price Impact.
- Application of Tests for Price Impact;
- Settlement Mitigation for Make-Whole Payment Impact;
- Ex-Post Mitigation for Physical Withholding:
  - Mitigation for Physical Withholding in the Energy Market; and
  - Mitigation for Physical Withholding in the Operating Reserve Market.
- Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties;
- Ex-Post Mitigation: Procedural Steps;
- Designation of Constrained Areas and Uncompetitive Interties;
- Reference Levels;
- Reference Quantities;
- Settlement Cost Recovery Requests; and
- Reporting on Mitigation.

### 3.2 Objectives

The main objective for the Market Power Mitigation framework in the future day-ahead market and *real-time market* is to help ensure efficient scheduling and pricing outcomes. The framework aims to achieve this objective by:

- Establishing ex-ante and ex-post mitigation processes to mitigate economic and physical withholding in the *energy* and *operating reserve* markets;
- Designating areas of the transmission grid as constrained areas. Such designations depend on the frequency and duration that competition is restricted in those areas;

- Establishing a cost-based reference level methodology to determine reference levels for financial and non-financial *dispatch data* parameters for resources;
- Identifying exercises of market power that can potentially impact *market prices* or affect compensation payments to *market participants*;
- Determining the impact, if any, to *market prices* and make-whole payments due to potential exercises of market power;
- Applying mitigation measures when exercises of market power that would otherwise impact *market prices* and make-whole payments are identified;
- Providing implementation guidelines for incorporating the conduct and impact tests in the scheduling processes in different timeframes;
- Allowing *market participants* to modify reference levels and apply for cost recovery on an ex-post basis under extenuating circumstances; and
- Publishing public and confidential reports to communicate information regarding the operation of the mitigation framework.

### 3.3 Terminology

In this document, the term ‘resource’ means a *generation unit* or a load within a *generation facility*, a storage *facility*, or a *dispatchable load*. Mitigation of a *bid* or *offer* refers to the mitigation of applicable *dispatch data* values that are provided by a *registered market participant* for a ‘resource’ as defined in the previous sentence.

The following table provides a list of some frequently used terms related to the Market Power Mitigation process and their definitions as they have been used in this document.

**Table 3-1: Market Power Mitigation Terminology**

Term	Definition
Active constraint	An active constraint is a constraint that was accounted for by a calculation engine as it ran its optimization.
As-offered results	The outcomes that would result if the <i>dispatch data</i> values as submitted by the <i>market participant</i> are used to calculate the prices and schedules.
Binding constraint	A binding constraint is a constraint that was scheduled at its limit by a calculation engine in the final step of running its optimization.
Broad Constrained Area (BCA)	An area where constraints that are not designated as an NCA or a DCA bind. These constraints result in dispatched-up resources for a particular run of the day-ahead or real-time scheduling process.
Conduct threshold	The conduct threshold determines how much a <i>dispatch data</i> value can deviate from its reference level without failing the conduct test.
Dual-fuel resources	Resources that have the capability to use two types of fuel to generate electricity and can opt to select any one of the fuel types at any given time.
Dynamic Constrained Area (DCA)	An area where a transmission constraint might bind relatively frequently but for a shorter duration than a year. These areas can be created by <i>outages</i> or de-ratings of grid components that may alter congestion patterns on the grid.
Economic withholding	Economic withholding occurs when a portion of, or all, available supply is offered at prices significantly higher than their short-run marginal costs and prices are higher as a result.

Term	Definition
<i>Energy per ramp hour</i>	Average quantity of <i>energy</i> in MWh that the resource is expected to produce in each ramp hour for hot, warm, and cold thermal state.
<i>Energy Ramp Rate</i>	The rate, in megawatts per minute (MW/min), at which a resource can increase or decrease its <i>energy</i> output.
Ex-ante mitigation process	A before-the-fact mitigation process that determines whether <i>offers</i> made by <i>market participants</i> were higher than what would be expected under competitive pressures, and if those higher <i>offers</i> raised prices as a result. Under this process, mitigation of <i>offers</i> will only occur if prices are affected. This mitigation process will impact outcomes in the <i>IESO</i> 's day-ahead, pre-dispatch and real-time calculation engines.
Ex-post mitigation process	Depending on the nature of withholding (i.e. economic or physical), after-the-fact mitigation process takes the form of <i>settlement</i> adjustments of out-of-market uplift payments, or <i>settlement</i> charges to provide a disincentive to engage in withholding. The ex-post process allows the <i>IESO</i> to determine the actual costs incurred for the period in which market power is being reviewed.
Global market power	Market power that can arise when competition is restricted because the <i>IESO</i> is unable to schedule incremental imports from other jurisdictions and <i>energy</i> or <i>operating reserve</i> supply conditions are limited.
Global Market Power Reference <i>Interties</i>	<i>Interties</i> that connect Ontario to another wholesale electricity market and that the <i>IESO</i> expects are able to provide an effective competitive discipline for local <i>market participant</i> behavior in southern Ontario.
Impact threshold	The margin that is used to determine whether prices in the as-offered results are significantly higher than prices in the reference level results. The impact threshold varies according to the extent to which competition is restricted. When competition is more frequently restricted, or absent, impact thresholds will be narrow.
<i>Intertie</i> border price	The nodal price at Global Market Power Reference <i>Interties</i> , ignoring <i>intertie</i> congestion.
Lead time	The amount of time, in hours, needed for a <i>generation unit</i> to start-up and reach its MLP from an offline state. The length of the lead time will depend on the thermal operating state of the <i>generation unit</i> as either hot, warm or cold.
Load pockets	Electrical areas that can be created when a single or multiple transmission constraints bind, leaving a reduced set of resources that can meet the load behind the transmission constraints. Prices within a load pocket may be higher than elsewhere in the province or region.
Local market power	Market power that can arise when competition is restricted due to transmission constraints or other localized operating restrictions.
Make-whole payment impact	The difference between the make-whole payment determined based on the reference level <i>dispatch data</i> and the make-whole payment determined based on the <i>dispatch data</i> used to determine prices and schedules. If the make-whole payment impact is greater than the relevant make-whole payment impact threshold, the make-whole payment impact test is failed.
Market control entities	Person(s) that determine the <i>offers</i> from the <i>market participant</i> 's resources, either directly or indirectly; and person(s) with whom a <i>market participant</i> has any form of agreement under which such <i>market participant</i> confers the rights or the ability to determine the quantity or price of <i>offers</i> and <i>bids</i> .

Term	Definition
<i>Maximum number of starts per day</i>	Number of times that a unit can be started within a <i>dispatch day</i> .
<i>Minimum loading point (MLP)</i>	Minimum output of <i>energy</i> specified by the <i>market participant</i> that can be produced by a resource under stable conditions without ignition support.
<i>Minimum generation block down time (MGBDT)</i>	Minimum time, in hours, between the time a resource was last at its <i>minimum loading point</i> before de-synchronization and the time the resource reaches its <i>minimum loading point</i> again after synchronization.
<i>Minimum generation block run-time (MGBRT)</i>	Number of hours, specified by the <i>market participant</i> , that a resource must be operating at <i>minimum loading point</i> ; in accordance with the technical requirements of the resource.
Narrow constrained area (NCA)	An area in which transmission constraints that create load pockets bind, or are expected to bind, relatively frequently over a long duration. The <i>IESO</i> will designate these areas based on the frequency of congestion expected for the upcoming year.
<i>Operating reserve ramp rate</i>	The rate, in megawatts per minute (MW/min), at which a resource can increase or decrease the amount of <i>operating reserve</i> scheduled.
Physical withholding	Physical withholding occurs when a portion of, or all, available capacity is not offered into the market and prices are higher as a result.
Price impact	The difference between the price at a resource determined based on the reference level <i>dispatch data</i> and determined based on the as-offered <i>dispatch data</i> . If the price impact is greater than the relevant price impact threshold, the price impact test is failed.
Ramp up <i>energy</i> to MLP	<i>Energy</i> , in MWh, a resource is expected to produce from the time of synchronization to the time it reaches its MLP. Ramp up <i>energy</i> to MLP is required for the hot, warm and cold thermal operating states of the resource.
Ramp hours to MLP	Number of hours required for the resource to ramp from synchronization to its MLP.
Reference level results	The outcomes that would result if the <i>dispatch data</i> values that failed the conduct test are substituted by their reference levels to calculate the prices and schedules.
Reference levels	Reference levels are <i>IESO</i> -determined estimates of what a <i>market participant</i> would have offered without restrictions to competition.
Reference quantities	Reference quantities are <i>IESO</i> -determined estimates for the quantity of <i>energy</i> or <i>operating reserve</i> a <i>market participant</i> would have offered without restrictions to competition.

### 3.4 Overview of the Market Power Mitigation Framework

The Market Power Mitigation framework in the future day-ahead market and *real-time market* will consist of both ex-ante and ex-post mitigation actions. These actions will enable the mitigation of economic and physical withholding to help ensure competitive market outcomes in the *IESO-administered markets*. The mitigation framework will consist of the following actions:

- Ex-ante validation of non-financial *dispatch data*;
- Ex-ante mitigation for economic withholding comprising:
  - Ex-ante mitigation for *energy* price impact; and
  - Ex-ante mitigation for *operating reserve* price impact.

- *Settlement* mitigation for make-whole payment impact;
- Ex-post mitigation for physical withholding:
  - Physical withholding in the *energy* market; and
  - Physical withholding in the *operating reserve* markets.
- Ex-post mitigation for economic withholding for uncompetitive *inerties*.

### 3.4.1 The Mitigation Process

A high-level overview of the mitigation process that the *IESO* will follow is described below:

- **Conditions:** To determine whether it is necessary to test for the exercise of market power, each specific type of mitigation assessment will define a set of conditions that, if met, will initiate the test. These predefined conditions indicate occasions when competition is restricted.
- **Resources Tested:** If the conditions to test for the exercise of market power are met, the *IESO* will identify the resources that need to be tested.
- **Conduct Test:** The *IESO* will implement a conduct and impact testing methodology that consists of two distinct tests. The first test is a conduct test that will be applied to those resources that need to be tested.

The conduct test will determine if any of the *dispatch data* offered by a resource deviates from its respective reference level by more than a specified conduct threshold. Conduct thresholds will vary based on the extent to which competition is restricted. Where competition is only infrequently restricted, conduct thresholds will be broad and will allow a *dispatch data* value to deviate more from its reference level without failing the conduct test. Where competition is more frequently restricted, or absent, conduct thresholds will be narrow and will allow a *dispatch data* value to deviate less from its reference level without failing the conduct test.

- **Impact Test:** The second test in this methodology is the impact test, which will be applied to the resources that fail the conduct test.

The *dispatch* and/or *settlement* outcomes obtained using the offered *dispatch data* values will be referred to in this document as the as-offered results. The *dispatch* and/or *settlement* outcomes that would result if the *dispatch data* values that failed the conduct test were substituted by their reference levels will be referred to as the reference level results. The impact test will compare the as-offered results to the reference level results to determine whether there was an impact on *market prices* or make-whole payments. If the difference between the two results exceeds the relevant impact test threshold, then the impact test is failed.

Similar to the conduct thresholds, the size of the price impact threshold will be based on the degree to which competition is restricted. When competition is infrequently restricted, price impact thresholds will be broad. When competition is more frequently restricted, or absent, impact thresholds will be narrow.

- **Mitigation Application:** When the impact test is failed, the *IESO* will determine the set of resources that will have *dispatch data* substituted with reference levels for the purpose of determining schedules, prices and make-whole payments. For these resources, the *IESO* will apply mitigation by substituting their *dispatch data* values that failed the conduct test with



their corresponding reference level values to determine dispatch schedules, prices and make-whole payments.

Figure 3-1 illustrates the conduct and impact testing methodology.

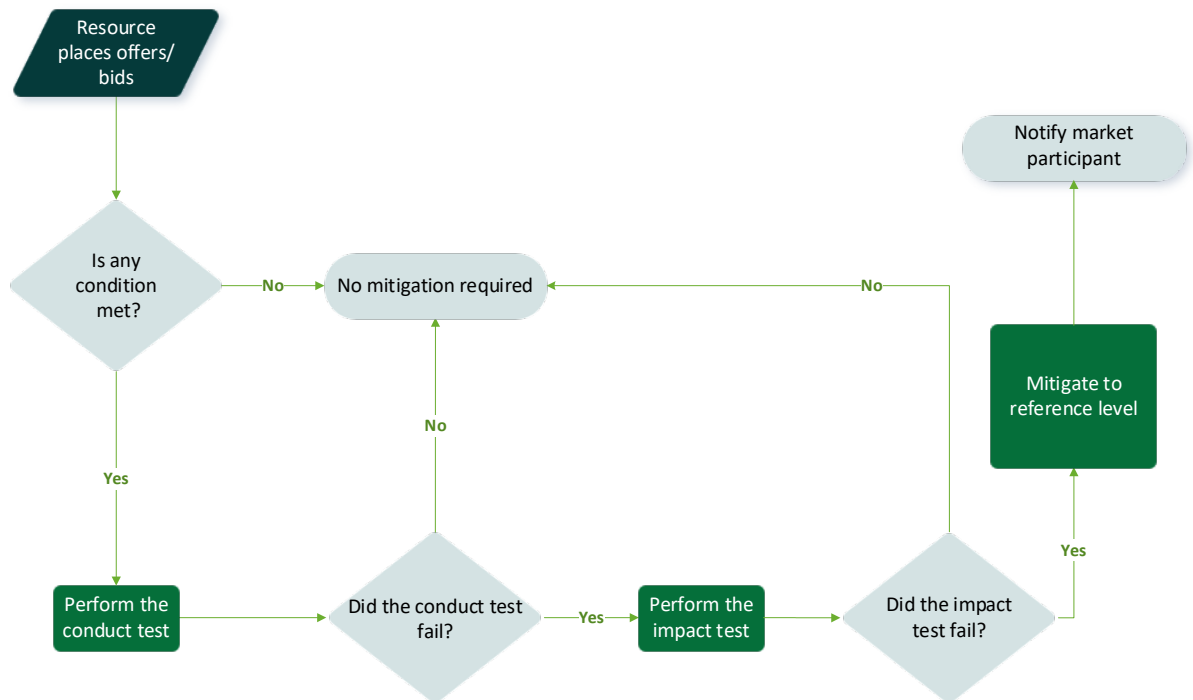


Figure 3-1 - Conduct and Impact Test Process Overview

### 3.4.2 Conditions to Test for Mitigation for Price Impact

The IESO will use a specific set of conditions to determine whether there is a need to test for a price impact.

These conditions are further categorized into local market power conditions and global market power conditions. Local market power is often a result of localized transmission constraints. Global market power can arise due to broader competitive restrictions such as a lack of additional competition from imports.

Table 3-2 provides a high-level description of the conditions that will lead to mitigation testing for price impact. The specifics of these conditions are discussed later in Section 3.6.1.

Table 3-2: Mitigation Conditions for Energy and Operating Reserve Price Impact Testing

Constrained Area	Description
Local Market Power for a Narrow Constrained Area (NCA) (Energy)	<ul style="list-style-type: none"> <li>• Competition is restricted because local transmission constraints are binding.</li> <li>• <i>Market participants</i> could exercise market power in local pockets, increasing <i>energy</i> prices in a narrow area.</li> <li>• NCA transmission constraints are designated on an annual basis and the designation of an NCA requires that these constraints bind or are expected to bind relatively frequently, creating a load pocket.</li> </ul>

	<ul style="list-style-type: none"> <li>• An NCA contains a specific set of resources that are tested for mitigation when the transmission constraint(s) that defines the NCA is binding.</li> </ul>
Local Market power for a Dynamic Constrained Area (DCA) ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Competition is restricted because local transmission constraints are binding.</li> <li>• <i>Market participants</i> could exercise market power in local pockets, increasing <i>energy</i> prices in a narrow area.</li> <li>• DCA transmission constraints are designated on an as-needed basis and designation of a DCA requires that these constraints bind or are expected to bind relatively frequently, creating a load pocket.</li> <li>• Conditions that could lead to designation of a DCA include medium-term transmission <i>outages</i> or equipment de-rates.</li> <li>• A DCA contains a specific set of resources that are tested for mitigation when the transmission constraint(s) that defines the DCA is binding.</li> </ul>
Local Market Power in the Broad Constrained Area (BCA) ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Competition is restricted because local transmission constraints are binding and resources are dispatched up.</li> <li>• The transmission constraints that are binding in the BCA tend to bind relatively infrequently. Conduct and impact thresholds are broad.</li> <li>• The BCA includes all dispatched up resources where there is significant positive congestion due to a transmission constraint that is not an NCA or a DCA constraint.</li> </ul>
Global Market Power ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Competition is restricted because the <i>IESO</i> is unable to schedule incremental imports from other jurisdictions and supply conditions are limited.</li> <li>• <i>Market participants</i> could exercise market power on the entire province, increasing <i>energy</i> prices broadly across Ontario.</li> </ul>
Local Market Power ( <i>Operating Reserve</i> )	<ul style="list-style-type: none"> <li>• Competition is restricted because there is an area reserve constraint that requires at least some positive quantity of <i>operating reserve</i> to be scheduled within that reserve area.</li> <li>• <i>Market participants</i> could exercise market power increasing <i>operating reserve</i> prices in the reserve area.</li> <li>• A reserve area contains a specific set of resources that are tested for mitigation any time that the relevant area reserve constraint has a minimum constraint value greater than 0 MW.</li> </ul>
Global Market Power ( <i>Operating Reserve</i> )	<ul style="list-style-type: none"> <li>• Competition is restricted because the <i>operating reserve</i> supply conditions are limited.</li> <li>• <i>Market participants</i> could exercise market power on the entire province, increasing <i>operating reserve</i> prices across Ontario.</li> </ul>

### 3.4.3 Conditions to Test for Mitigation for Make-Whole Payment Impact

The *IESO* will use a specific set of conditions to assess the need to test for a make-whole payment impact. If market conditions exist that allow *market participants* to affect make-whole payments, the *IESO* will perform the conduct test on resources using the applicable conduct thresholds.

Any resource tested for an impact to price will also be tested for an impact to make-whole payments. However, there are additional conditions that will potentially require testing for make-whole payment impact even when the resource is not tested for price impact.

The detailed specifications for the conditions for testing for make-whole payment impact are listed in Section 3.8.

Table 3-3 lists the conditions that will lead to mitigation testing for make-whole payment impact.

**Table 3-3: Mitigation Conditions for Make-Whole Payment Impact Testing**

Conditions	Description
Local Market Power for an NCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>The resource was tested for local market power in the <i>energy</i> market for an NCA; or</li> <li>When the resource was committed inside of a binding or an active NCA constraint and it would have otherwise received a make-whole payment in the absence of make-whole payment mitigation.</li> </ul>
Local Market power for a DCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>The resource was tested for local market power in the <i>energy</i> market for a DCA; or</li> <li>When the resource was committed, it was on the import-congested side of a binding or an active DCA constraint and it would have otherwise received a make-whole payment in the absence of make-whole payment mitigation.</li> </ul>
Local Market Power in the BCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>The resource was tested for local market power in the <i>energy</i> market for the BCA; or</li> <li>When the resource was committed it was on the import-congested side of a binding or active constraint and it would have otherwise received a make-whole payment in the absence of make-whole payment mitigation.</li> </ul>
Local Market Power for Reliability Constraints ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>The resource was scheduled as a result of a <i>reliability</i> constraint.</li> </ul>
Local Market power ( <i>Operating Reserve</i> )	<ul style="list-style-type: none"> <li>The resource was tested for local market power in the <i>operating reserve</i> market and would have otherwise received a make-whole payment in the absence of make-whole payment mitigation.</li> </ul>
Global Market Power ( <i>Energy</i> ) □	<ul style="list-style-type: none"> <li>The resource was tested for price impact for global market power in the <i>energy</i> market; or</li> <li>The resource was committed as a result of the <i>pre-dispatch scheduling</i> process and would have otherwise received a make-whole payment above a threshold value in the absence of make-whole payment mitigation.</li> </ul>
Global Market Power ( <i>Operating Reserve</i> )	<ul style="list-style-type: none"> <li>The resource was tested for global market power in the <i>operating reserve</i> market.</li> <li>A non-quick start (NQS) resource is committed and scheduled to provide <i>operating reserve</i> and would have otherwise received a make-whole payment above a threshold value in the absence of make-whole payment mitigation.</li> </ul>

The following sub-sections describe the specifics of how the *IESO* will use these conditions to determine the need for mitigation testing and how the mitigation process will be applied in the different mitigation scenarios.

### 3.5 Ex-Ante Validation of Non-Financial Dispatch Data

To mitigate the exercise of market power, the *IESO* will validate the non-financial *dispatch data* for a resource at the time of *dispatch data* submission. The non-financial *dispatch data* values will be validated against their corresponding reference levels. The *IESO* will evaluate whether the non-financial *dispatch data* exceeds the parameter's reference level plus a predefined conduct threshold. If any one of the submitted non-financial *dispatch data* parameters is outside the acceptable range determined by the reference level and the conduct threshold, that non-financial *dispatch data* will be rejected. Testing of non-financial *dispatch data* will not include a price impact test.

Table 3-4 provides the conduct thresholds to be used in the validation of non-financial *dispatch data*.

**Table 3-4: Conduct Thresholds for Non-Financial Dispatch Data**

Dispatch Data	Threshold
<i>Minimum generation block run-time</i>	Submitted MGBRT is more than the lesser of 100% or 3 hours above the reference level.
<i>Minimum generation block down time</i>	Submitted MGBDT is more than the lesser of 100% or 3 hours above the reference level for any thermal state; or submitted MGBDT across all thermal states more than 6 hours above the total reference levels across all thermal states.
<i>Minimum loading point</i>	Submitted MLP is greater than 100% above reference level
<i>Energy ramp rate</i>	Submitted <i>energy</i> ramp rate offered is lower than 50% of the reference level
<i>Operating reserve ramp rate</i>	Submitted <i>energy</i> ramp rate offered is lower than 50% of the reference level
Lead time	Submitted lead time is more than the lesser of 100% or 3 hours above the reference level for any thermal state; or submitted lead time across all thermal states is more than 6 hours above the total reference levels across all thermal states.
Ramp hours to MLP	Submitted ramp hours to MLP is more than the lesser of 100% or 3 hours above the reference level for any thermal state.
<i>Energy per ramp hour</i>	Submitted <i>energy</i> per ramp hour is more than 50% above the upper bound reference level or 50% below the lower bound reference level for any thermal state.
<i>Maximum number of starts per day</i>	Submitted <i>maximum number of starts per day</i> is 50% lower than the reference level or lower than 1.

### 3.6 Ex-Ante Mitigation for Economic Withholding

Economic withholding occurs when one or more *market participants* offer a portion of, or all, of their resource's available capacity at prices materially higher than short-run marginal costs. Mitigation for economic withholding in *energy* and *operating reserve* follows a consistent framework but differ in certain aspects. In each case, there are conditions that must be met before mitigation is applied. If these conditions are met, a set of resources is identified to which a conduct test is applied. Resources violating the thresholds of the conduct test are then tested for impact. If the impact test is failed, the *dispatch data* parameters of resources that failed the conduct test are mitigated.

The *IESO* will use reference levels and conduct thresholds to test for the potential for the exercise of market power via economic withholding. Resources will be tested ex-ante for potential price impacts. Section 3.13 describes the process that the *IESO* will use to determine reference level values.

Figure 3-2 depicts the steps that will be performed when assessing if there is a price impact

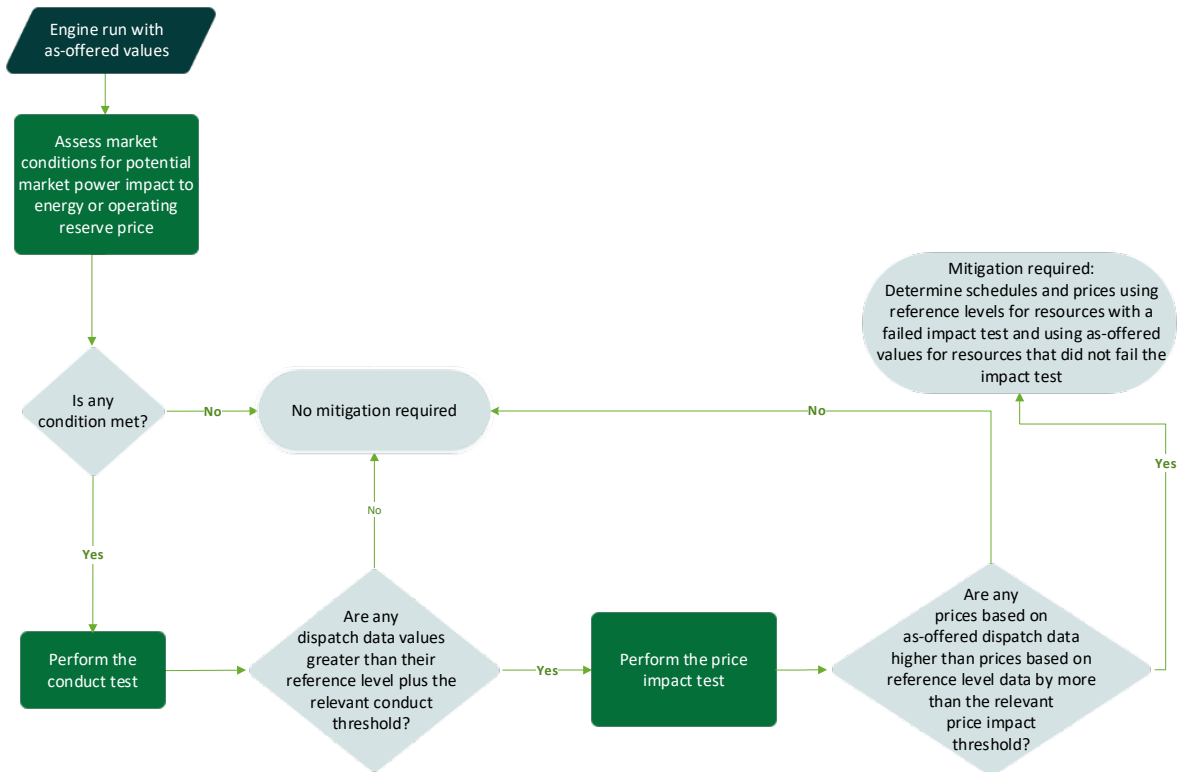


Figure 3-2: Conduct and Impact Testing Methodology for a Price Impact

### 3.6.1 Ex-Ante Mitigation for Energy Price Impact

The *IESO* will test system conditions for the potential exercise of local and global market power in the *energy market* and apply the ex-ante mitigation process to test the relevant resources for price impact.

The following sub-sections will describe the process that the *IESO* will apply to the resources that need to be tested for mitigation in the various types of constrained areas.

#### 3.6.1.1 Local Market Power Mitigation for Energy Price Impact in NCAs and DCAs

The *IESO* will use an identical process for mitigating resources for local market power price impact in NCAs and DCAs. The *IESO* will test if resources meet the predefined conditions for a constrained area, and then apply the conduct and impact tests to identify the relevant *dispatch data* that need to be mitigated.

**Conditions:** The condition for testing for local market power in an NCA or a DCA will be met when at least one of the transmission constraints that define an NCA or a DCA is binding in the as-offered scheduling pass of the relevant calculation engine.

**Resources Tested:** When at least one of the transmission constraints that define a particular NCA or a DCA is binding, the *IESO* will test all resources that have submitted *offers* and are a part of the identified area.

**Conduct Test:** The *IESO* will apply a conduct test to all resources in the regions identified in the test above. The conduct test will identify all resources with *energy offers*, start-up offers or speed no-load offers that violate the relevant conduct thresholds.

**Table 3-5: Conduct Thresholds for Price Impact Testing for NCAs and DCAs**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer</i> price is greater than either 50% or \$25/MWh above reference level value; <i>offers</i> below \$25/MWh are excluded from economic withholding tests.
Start-up offer	Start-up offer is greater than 25% above reference level
Speed no-load offer	Speed no-load offer is greater than 25% above reference level

**Impact Test:** Resources that have *offered* outside their conduct thresholds will be subject to the impact test. For these resources, all *dispatch data* parameters that violated the conduct test will be set to their respective reference level for the purpose of determining price impacts. If the price impact for the resource is greater than the corresponding NCA or DCA price impact threshold, the impact test is failed.

**Table 3-6: Price Impact Thresholds for NCAs and DCAs**

Dispatch Data	Threshold
NCA <i>energy offer</i>	<i>Energy</i> LMP in the as-offered pricing pass of the relevant calculation engine is either 50% higher than or \$25/MWh above the <i>energy</i> LMP from the reference level pricing pass.
DCA <i>energy offer</i>	<i>Energy</i> LMP in the as-offered pricing pass of the relevant calculation engine is either 50% higher than or \$25/MWh above the <i>energy</i> LMP from the reference level pricing pass.

**Mitigation Application:** If there is a price impact in excess of the impact threshold at any resource that is part of an NCA or a DCA, then the *IESO* will apply the mitigation process to all resources that are part of that area and that failed the conduct test. The *dispatch data* values failing the conduct test for all these resources will be substituted with their relevant reference levels to determine *dispatch* schedules and prices.

### 3.6.1.2 Local Market Power Mitigation for Energy Price Impact in the BCA

Transmission constraints that are not NCA or DCA constraints may result in the *dispatch* up of supply resources. These resources are collectively defined as being inside a Broad Constrained Area (BCA).

**Conditions:** The *IESO* will test for local market power in the BCA when any resource that is not a part of an NCA or DCA has a congestion component greater than \$25/MWh.

**Resources Tested:** All resources within the BCA that have positive congestion components greater than a threshold value of \$25/MWh will be subject to the conduct and impact tests.

**Conduct Test:** The *IESO* will apply a conduct test to all identified resources to determine resources with *dispatch data* that violate the conduct test thresholds.

**Table 3-7: Conduct Thresholds for Price Impact Testing for BCAs**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer price is greater than either 200% or \$100/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.</i>
Start-up offer	Start-up offer is greater than 100% above reference level
Speed no-load offer	Speed no-load offer is greater than 100% above reference level

**Impact Test:** Resources that are being tested for local market power in the BCA and that have failed their conduct tests will be subject to the impact test.

The price impact test is failed for a resource if there is a price impact at the resource that is greater than the BCA price impact threshold, as listed in Table 3-8.

**Table 3-8: Price Impact Threshold for BCAs**

Dispatch Data	Threshold
BCA <i>energy offer</i>	<i>Energy LMP in the as-offered pricing pass of the relevant calculation engine is either 100% higher than or \$50/MWh above the energy LMP from the reference level pricing pass.</i>

**Mitigation Application:** For all resources that failed the price impact test, the *IESO* will substitute the *dispatch data* parameters that were offered outside of their conduct thresholds with their respective reference levels. The calculation engine will determine the *dispatch* schedules and prices based on the substituted values.

### 3.6.1.3 Global Market Power Mitigation for Energy Price Impact

Global market power conditions are intended to assess whether competition is restricted due to reasons other than local transmission constraints and if the preconditions for the exercise of global market power exist. These conditions are based on global constraints that might potentially restrict competition across the market as a whole.

#### Reference Interties

To assess restrictions to global competition, the *IESO* will examine conditions at certain *interties*. The *IESO* will limit this assessment to *interties* that connect Ontario to another wholesale electricity market and are able to provide an effective competitive discipline for *market participant* behavior. These *interties* will be referred to as the Global Market Power Reference Interties. At this time, the *IESO* considers the New York-Ontario *intertie* and the Michigan-Ontario *intertie* to be the Global Market Power Reference Interties.

The *IESO* will have the ability to modify the designation of Global Market Power Reference Interties should the need arise.

**Conditions:** The *IESO* has identified two conditions to determine if the potential for the exercise of global market power exists: a restricted ability to schedule incremental imports (condition 1) and a price condition (condition 2). The conditions for testing for global market power will be performed, separately, in the day-ahead market and *pre-dispatch scheduling* processes.

If both condition 1 and condition 2 are met in either the day-ahead market or *pre-dispatch scheduling* processes, then the *IESO* will test resources that can provide incremental supply for market power mitigation in the scheduling process in which the conditions were met.



### Condition 1 - Incremental Imports

Condition 1 for global market power will be met when Ontario is unable to schedule incremental imports for any of the following reasons:

- Import Congestion: The *IESO* will assess congestion associated with the import/export limits at all of the Global Market Power Reference Interties. If this congestion is negative for all Global Market Power Reference Interties, then these *interties* will be determined to be import congested and the incremental import condition will be met for that *dispatch hour* in the relevant scheduling process; or
- Net Intertie Scheduling Limit (NISL) Binding for Imports: The incremental import condition in regards to the NISL will be met if the NISL shadow price is negative for that *dispatch hour* in the relevant scheduling process; or
- Pre-dispatch Look-Ahead: The *pre-dispatch scheduling* process will not assess day-at-hand imports or exports further than two-hours ahead of the *dispatch hour*. As a result, the incremental import condition for hours further than two-hours from the *dispatch hour* is always met; or
- Other reasons: Operational actions such as pre-emptive curtailment and transmission loading relief actions can prevent flow from other jurisdictions without necessarily resulting in import congestion or in the NISL binding. Where possible, the *IESO* will design automated checks to identify instances in the day-ahead scheduling process or the *pre-dispatch scheduling* process when these other reasons result in an inability to schedule incremental imports. The incremental import conditions for these other reasons will be met if:
  - Operational actions are preventing incremental imports on one of the Global Market Power Reference Interties and there are negative congestion components at all of the other Global Market Power Reference Interties, or
  - Operational actions are preventing incremental imports on all of the Global Market Power Reference Interties.

### Condition 2 - Price

If nodal prices at the Global Market Power Reference Interties ignoring *intertie* congestion – referred to in this document as the *intertie* border price (IBP) – are greater than the specified threshold value of \$100/MWh in the results of either the day-ahead market or the *pre-dispatch scheduling* process, then condition 2 will be met.

**Resources Tested:** The test for market power mitigation for global market power will be triggered when both condition 1 and condition 2 are met. The *market participants* tested for global market power will be limited to those with resources that can meet incremental load within Ontario.

**Conduct Test:** The *IESO* will apply a conduct test to all resources that meet the conditions above.

**Table 3-9: Conduct Thresholds for Price Impact Testing for Global Market Power - Energy**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer</i> price is greater than either 200% or \$100/MWh above reference level value; <i>offers</i> below \$25/MWh are excluded from economic withholding tests.
Start-up offer	Start-up offer is greater than 100% above reference level
Speed no-load offer	Speed no-load offer is greater than 100% above reference level



**Impact Test:** Resources that have offered outside their conduct thresholds will be subject to the impact test. The price impact test is failed if there is a price impact at all of the Global Market Power Reference Interties greater than the *energy* price impact threshold for global market power.

**Table 3-10: Price Impact Threshold for Global Market Power - Energy**

Dispatch Data	Threshold
Global ( <i>Energy</i> )	<i>Energy</i> LMP at each of the Global Market Power Reference Interties in the as-offered pricing pass of the relevant calculation <i>energy</i> is either 100% higher than or \$50/MWh above the <i>energy</i> LMP at the same Global Market Power Reference Intertie in the reference level pricing pass

**Mitigation Timing:** The *IESO* will test for global market power in the day-ahead market and in each run of the *pre-dispatch scheduling* process.

If the conditions for global market power are met for a particular *dispatch hour*, then the *IESO* will test relevant resources for mitigation for global market power for that *dispatch hour*.

If the conditions for global market power are met for the one-hour ahead in the *pre-dispatch scheduling* process, then resources tested for that *dispatch hour* will continue to be tested during the real-time *dispatch* for that hour. This will be subject to the ability to run conduct and impact tests in the real-time *dispatch*. These resources will be tested regardless of whether real-time conditions meet the conditions to test for mitigation.

**Mitigation Application:** The *IESO* will determine if there is a price impact in excess of the global market power impact threshold at any resource tested for global market power. If there is, the *IESO* will substitute the *dispatch data* that violated the relevant conduct threshold with the relevant reference level for any resource failing the conduct test. The schedules and prices will be derived based on the substituted values.

### 3.6.2 Ex-Ante Mitigation for Operating Reserve Price Impact

When certain conditions that restrict competition have been met, the *IESO* will test for the exercise of local market power and global market power in the *operating reserve market*. This will involve conduct and impact tests to determine whether there is an impact to *operating reserve* prices.

There are three classes of *operating reserve*: 10-minute spinning (10S), 10-minute non-spinning (10N) and 30-minute reserves (30R). These classes of *operating reserve* reflect a hierarchy in which:

- 10S *offers* can be scheduled to satisfy 10S, 10N or 30R requirements;
- 10N *offers* can be scheduled to satisfy 10N or 30R requirements; and
- 30R *offers* can only be scheduled to satisfy the requirement for 30R.

When a particular class of *operating reserve* is tested for market power mitigation, it includes testing all *offers* that can satisfy that specific requirement. For example, if 10N is being tested for mitigation, all *operating reserve offers* for 10N and 10S must be tested for mitigation.

The first step in this testing process is to appropriately identify conditions where market power might have been exercised and if resources should be tested. The *IESO* has determined multiple conditions that can trigger the mitigation process. The following sub-sections will describe the process that the *IESO* will implement to identify different types of constraints and to apply mitigation to the relevant resources.

### 3.6.2.1 Local Market Power Mitigation for Operating Reserve Price Impact

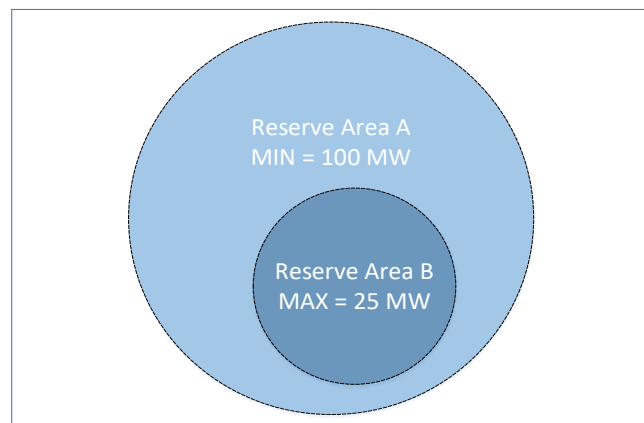
The *IESO* can set *operating reserve* requirements for specific localized regions, referred to as reserve areas. These requirements can take the form of allowing no more, or no less, than some amount of *operating reserve* of a particular class to be scheduled within that region. These are referred to as MAX or MIN constraints for reserve areas.

If there is a binding MAX constraint on a reserve area, resources in that reserve area will be unable to provide additional *operating reserve* in that reserve area. These resources will be unable to exercise market power due to their inability to provide incremental *operating reserve*. Therefore, such resources will not be tested for local market power mitigation for *operating reserve*.

**Conditions:** The MIN area reserve constraints are typically set to zero, which means that there is no minimum amount of *operating reserves* which the *IESO* must schedule within that reserve area. This reflects the fact that the need to schedule a minimum amount of *operating reserve* within a given area is relatively uncommon. However, at times a reserve area may have a minimum constraint greater than zero. In such situations, a resource could have the ability to increase *operating reserve* prices or make-whole payments due to the local need for *operating reserve*. The conditions for testing for local market power mitigation for *operating reserve* are met when a MIN area reserve constraint has a value greater than 0 MW.

**Resources Tested:** When the conditions for local market power mitigation for a specific class of *operating reserve* are met, all resources offering *operating reserve* that can meet that class of reserves in that reserve area will be tested.

Area reserve constraints are sometimes nested inside other area reserve constraints in the Ontario grid. See Figure 3-3 below for an illustrative example.



**Figure 3-3: Nested Area Reserve Constraints**

In this example scenario, a large area reserve constraint, Reserve Area A, has a MIN constraint of some value greater than 0 MW. A smaller area reserve constraint – Reserve Area B – is nested within this large area reserve constraint. Resources in Reserve Area B may be unable to provide incremental reserves even though they are inside Reserve Area A, and would otherwise be treated as if they potentially had market power.

Resources within a region in which the incremental *operating reserve* of a given class cannot be scheduled due to a MAX area reserve constraint will not be tested.

**Conduct Test:** For all resources offering *operating reserve* in a specific class that are eligible to be tested, the *IESO* will carry out the conduct test.

Table 3-11 lists the conduct thresholds that will be applied to the local market power test for *operating reserves*.

**Table 3-11: Conduct Thresholds for Price Impact Testing for Local Market Power–Operating Reserve**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	Offer price is greater than either 10% or \$25/MW above reference level value; offers below \$5/MW excluded from economic withholding tests.
Speed no-load offer	Speed no-load offer is greater than 10% above reference level
Start-up offer	Start-up offer is greater than 10% above reference level
<i>Energy offers for the range of production up to MLP</i>	Offer price is greater than 10% or \$25/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.

**Impact Test:** For resources offering a specific class of *operating reserve*, the price impact test for local market power will:

1. Compare prices from the as-offered pricing pass of the relevant calculation engine to the prices from the reference level pricing pass.
2. Fail if the price in the as-offered pricing pass exceeds the price in the reference level pricing pass by more than the impact threshold.

Table 3-12 lists the impact thresholds for local market power for *operating reserve* that will be used for these resources.

**Table 3-12: Price Impact Threshold for Local Market Power –Operating Reserve**

Dispatch Data	Threshold
Local ( <i>Operating Reserve</i> )	Operating reserve LMP in the as-offered pricing pass of the relevant calculation engine is higher than <i>operating reserve</i> LMP from the reference level pricing pass

**Mitigation Application:** When the price impact test is failed for *operating reserve* for a particular reserve area, the *IESO* will:

1. Determine the resources that were tested for local market power for *operating reserve* of that class and which failed the conduct test for that class.
2. For the identified resources, substitute the *dispatch data* values that were offered outside of their conduct thresholds with their respective reference levels to determine *dispatch* schedules and prices.

### 3.6.2.2 Global Market Power Mitigation for Operating Reserve Price Impact

Global market power mitigation for *operating reserve* is intended to address occasions where *market participants* have market power across Ontario for a class of *operating reserve*.

**Conditions:** The condition to test for global market power for a class of *operating reserve* will be met when the unmitigated market clearing price of a class of *operating reserve* exceeds a threshold level of \$15/MW.

**Resources Tested:** When the conditions for global market power mitigation for a specific class of *operating reserve* are met, all resources offering that class of *operating reserve* will be tested, except for resources that are in a reserve area with a binding MAX area reserve constraint.

Resources within a region in which incremental *operating reserve* of a given class could not be scheduled due to a binding MAX area reserve constraint will not be tested because they cannot provide incremental *operating reserve*.

**Conduct Test:** The IESO will carry out the conduct test for all resources eligible to be tested. The conduct test will assess whether the *dispatch data* for a resource offering *operating reserve* of a specific class violates the conduct threshold for that type of *operating reserve*.

Table 3-13 lists the conduct thresholds that will be applied to the global market power test for *operating reserves*.

**Table 3-13: Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	Offer price is greater than either 50% or \$25/MW above reference level value; offers below \$5/MW are excluded from economic withholding tests.
Speed no-load offer	Speed no-load offer is greater than 25% above reference level
Start-up offer	Start-up offer is greater than 25% above reference level
Energy offers for the range of production up to MLP	Offer price is greater than either 50% or \$25/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.

**Impact Test:** For resources offering a specific class of *operating reserve*, the price impact test for global market power will:

1. Compare prices from the as-offered pricing pass of the relevant calculation engine to the prices from the reference level pricing pass.
2. Fail if the price in the as-offered pricing pass exceeds the price in the reference level pricing pass by more than the impact threshold

Table 3-14 lists the impact thresholds for global market power for *operating reserve* that will be used for these resources.

**Table 3-14: Price Impact Threshold for Global Market Power – Operating Reserve**

Dispatch Data	Threshold
Global ( <i>Operating Reserve</i> )	<i>Operating reserve</i> LMP in the as-offered pricing pass of the relevant calculation engine is either 50% higher than or \$25/MW above the <i>operating reserve</i> LMP from the reference level pricing pass

**Mitigation Application:** When the price impact test is failed for a class of *operating reserve*, the IESO will:

1. Determine the resources that were tested for global market power for *operating reserve* of that class and failed the conduct test for that class.
2. For those resources, substitute the *dispatch data* that were offered outside of their conduct thresholds with their respective reference levels to determine *dispatch* schedules and prices.

### 3.7 Application of Tests for Price Impact

Mitigation tests for price impact will be applied in the day-ahead market (DAM) and the *pre-dispatch* (PD) *scheduling* processes. If processing time permits, the IESO will also implement mitigation tests for price impact in the real-time dispatch (RTD) *scheduling* process. Whether this is possible will be

determined in the implementation phase. The following sub-sections discuss how the scheduling processes will incorporate the mitigation tests for price impact in the three different timeframes.

The following sub-sections focus on how the price impact mitigation tests will be applied in the DAM and PD scheduling processes.

### 3.7.1 Price Impact Mitigation in the DAM and PD Timeframes

For each hour of the DAM or PD look-ahead period for which any of the conditions for testing for mitigation are met, the relevant calculation engine will:

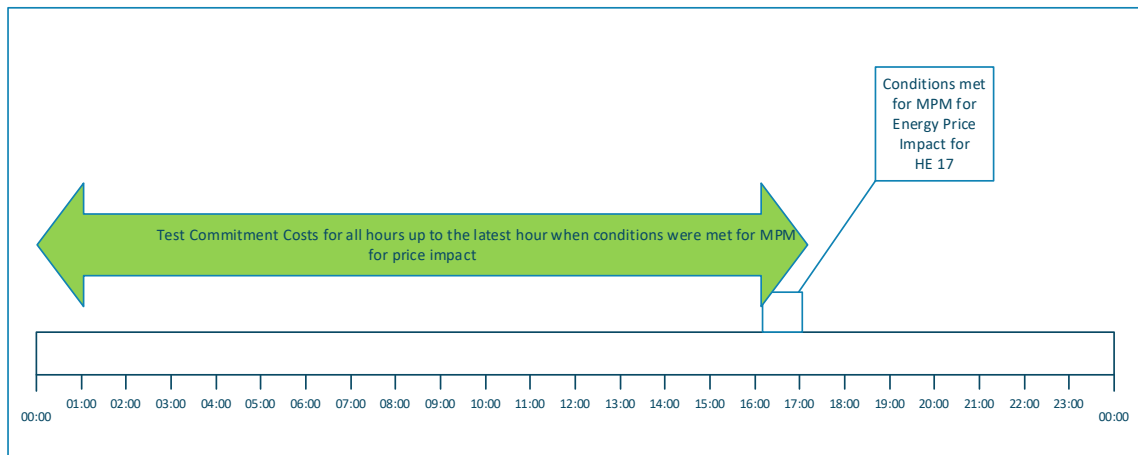
1. Test each resource that meets these conditions to determine if the applicable conduct and impact tests for price impact failed.
2. If one or more *dispatch data* values of the resource fails the conduct test and the price impact test is failed for the resource, substitute the resource’s *offered values* for those *dispatch data* parameters with their reference levels to determine DAM or PD schedules and prices.

#### 3.7.1.1 Ex-Ante Commitment Cost Mitigation in the DAM and PD Timeframes

Commitment costs for a resource include start-up costs, speed no-load costs and *energy* costs up to its *minimum loading point*. If the conditions for testing for price impact are met in an hour of the DAM or PD look-ahead period, then commitment costs for the relevant resources will be tested for all hours in that look-ahead period up to and including the hour when the conditions were met.

If conditions are met for more than one constrained area for the same resource<sup>1</sup>, then the commitment costs will be tested using the most restrictive of the conduct thresholds.

This is to identify whether *offered* commitment costs in earlier hours could have had a price impact in the relevant hour. Figure 3-4 illustrates this description in the DAM timeframe when the conditions for testing for price impact are met in hour ending 17.



**Figure 3-4: Mitigation in the DAM Timeframe**

If the price impact test fails for any hour up to and including the hour that met the relevant conditions for price impact testing, then the *IESO* will replace the commitment cost offers for all hours leading up to and including that hour with the appropriate reference level values. This differs from the

<sup>1</sup> For example, a resource could meet the conditions for testing in an NCA and a BCA.

mitigation of *energy* offers for the dispatchable range above MLP, which are mitigated only in the hours when the price impact test is failed.

### 3.7.1.2 Mitigation of Non-Quick Start Resources in Real Time

If an NQS resource was committed in the PD scheduling process but was not committed in the DAM, and it had *dispatch data* parameters that were mitigated at the time of commitment, then those *dispatch data* parameters will continue to be mitigated in the RTD. These *dispatch data* parameters will not be reassessed by subsequent runs of the PD scheduling process.

### 3.7.2 Ex-Ante Mitigation in the RT timeframe

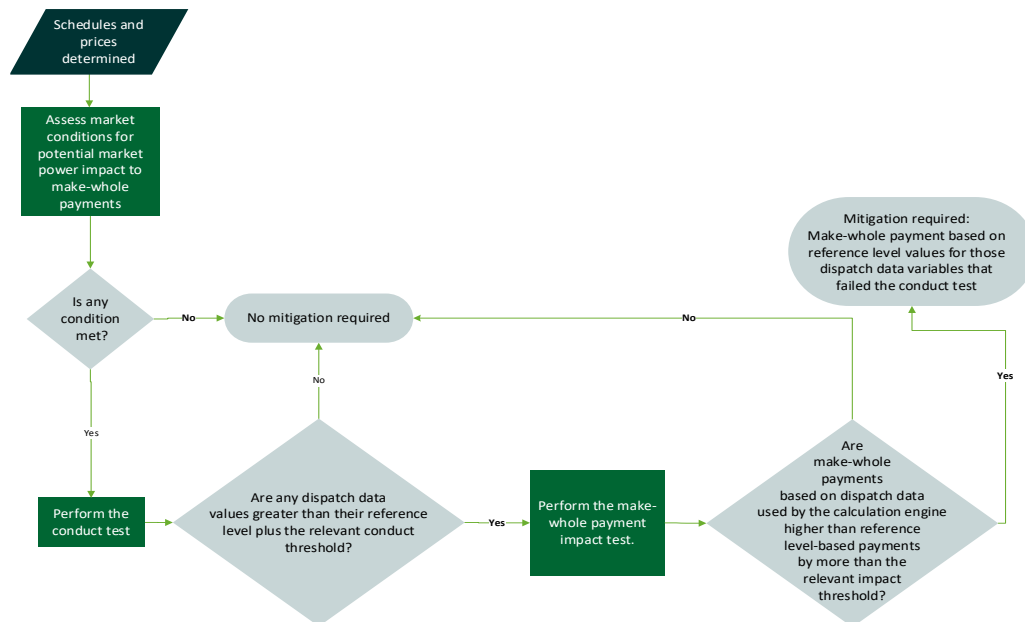
Mitigation may be applied based on conduct and impact testing within the RT calculation engine. If mitigation is instead applied in RTD based on an assessment by the PD calculation engine, then the decision to mitigate RTD will be made with hourly granularity for an entire *dispatch hour* based on the last PD results for the *dispatch hour*.

## 3.8 Settlement Mitigation for Make-Whole Payment Impact

The *IESO* will test market conditions for exercise of local market power and global market power and apply a *settlement* mitigation process to test the relevant resources for make-whole payment impact. The following sub-sections will detail the process that the *IESO* will implement to identify and mitigate the relevant resources.

If conditions are met for more than one constrained area for the same resource in the same interval, hour or commitment period,<sup>2</sup> then the mitigation of make-whole payments will be tested using the most restrictive set of conduct thresholds.

Figure 3-5 depicts the steps in the settlement mitigation process for make-whole payment impact.



**Figure 3-5: Conduct and Impact Testing Methodology for a Make-Whole Payment Impact**

<sup>2</sup> For example, a resource could meet the conditions for testing in an NCA and a BCA in the interval, hour or commitment period.

### 3.8.1 Local Market Power for Make-Whole Payment Impact in NCAs and DCAs

#### Conditions:

When any of the following conditions are met, the *IESO* will carry out the conduct and impact tests for make-whole payment impact in an NCA or a DCA:

- A resource met the conditions for ex-ante mitigation for price impact in an NCA or DCA where at least one transmission constraint that defines an NCA or DCA is binding; or
- An NQS resource was committed, which would otherwise receive a make-whole payment. This resource also has a positive congestion component greater than \$0/MWh on any binding constraint that is an NCA or DCA constraint;<sup>3</sup> or
- An NQS resource was committed, which would otherwise receive a make-whole payment. This resource has a Generation Shift Factor (GSF) greater than 0.02 on an active constraint that is an NCA or DCA constraint. This constraint would have been binding or would have been violated but for the commitment of the resource.<sup>4</sup>

**Resources Tested:** To identify any impact to make-whole payments due to local market power, the *IESO* will test the following resources for make-whole payment impact:

- All relevant resources that are a part of those constrained areas that received make-whole payments; and
- Any NQS resource committed inside a constrained area when the transmission constraints that define a particular constrained area would have been binding, absent the commitment of that NQS resource.

**Conduct Test:** The *IESO* will apply a conduct test to all resources identified in the test discussed above.

Table 3-15 describes the NCA and DCA conduct thresholds that will be used to identify make-whole payment impact.

**Table 3-15: Make-Whole Payment Conduct Thresholds for NCAs and DCAs**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer price is greater than either 50% or \$25/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.</i>
Start-up offer	Start-up offer is greater than 25% above reference level.
Speed no-load offer	Speed no-load offer is greater than 25% above reference level.

<sup>3</sup> Note that this threshold is specific to the individual binding NCA or DCA constraints, it is not set based on the aggregate congestion component at the resource. The price impact test for the NCA or DCA is done based on the aggregate congestion component at the resource.

<sup>4</sup> The *IESO* will compare the unloaded capacity of each of these constraints to the relief (i.e., unloading of the constraint) provided by each individual committed NQS resource receiving make whole payments and that relieves that particular constraint. This calculation will test whether the constraint would have bound had the individual resource not been committed.



**Impact Test:** All resources that failed the conduct test for local market power for an NCA or a DCA will be subject to the impact test.

Table 3-16 describes the NCA and DCA impact thresholds that will be used for make-whole payments.

**Table 3-16: Make-Whole Payment Impact Threshold for NCAs and DCAs**

Dispatch Data	Threshold
NCAs and DCAs (Energy)	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offers</i> parameters which failed the conduct test.

**Mitigation Application:** For any resource that fails the impact test for make-whole payments, the IESO will re-calculate the make-whole payment using the reference levels for those *dispatch data* values that were outside of the allowed conduct thresholds.

### 3.8.2 Local Market Power for Make-Whole Payment Impact in the BCA

**Conditions:** When a resource meets any of the following conditions, that resource will be subject to testing for make-whole payment mitigation as part of the BCA:

- The resource met the conditions for ex-ante mitigation for price impact in the BCA; or
- An NQS resource was committed, which would otherwise receive a make-whole payment, and has a positive congestion component greater than \$0/MWh on any binding constraint that was not an NCA or DCA constraint<sup>5</sup>; or
- An NQS resource was committed, which would otherwise receive a make-whole payment, and has a GSF greater than 0.02 on an active constraint that was not an NCA or DCA constraint and which would have been binding or been violated but for the commitment of the resource.<sup>6</sup>

**Resources Tested:** All resources that meet any of the conditions above will be tested for make-whole payment impact for local market power in the BCA.

**Conduct Test:** The IESO will apply a conduct test to all resources that have been identified as being in the BCA using the thresholds listed in Table 3-17.

<sup>5</sup> Note that this threshold is specific to the individual binding BCA constraints, it is not set based on the aggregate congestion component at the resource. The price impact test for the BCA is done based on the aggregate congestion component at the resource.

<sup>6</sup> The IESO will compare the unloaded capacity of each of these constraints to the relief (unloading of the constraint) provided by each individual committed NQS resource receiving make-whole payments and that relieves that particular constraint. This calculation will test whether the constraint would have been binding had the individual resource not been committed.<sup>7</sup> The decision to mitigate resources that were tested ex-ante for price impact will mean that the calculation of any make-whole payment amount will be done based on mitigated parameter values so it is not necessary to mitigate the make-whole payment separately in these cases. Only when resources were tested for mitigation for price impact but were not mitigated for price impact do resources need to be tested for make-whole payment in addition to the price impact testing.



**Table 3-17: Make-Whole Payment Conduct Thresholds for BCAs**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer price is greater than either 200% or \$100/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.</i>
Start-up offer	Start-up offer is greater than 100% above reference level
Speed no-load offer	Speed no-load offer is greater than 100% above reference level

**Impact Test:** Resources that failed the conduct test will be subject to the impact test using the threshold specified in Table 3-18.

**Table 3-18: Make-Whole Payment Impact Threshold for BCAs**

Dispatch Data	Threshold
BCAs ( <i>Energy</i> )	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offers</i> parameters which failed the conduct test.

**Mitigation Application:** For any resource that fails the impact test for make-whole payments, the IESO will re-calculate the make-whole payment using the reference levels for those *dispatch data* values that were outside of the allowed conduct thresholds.

### 3.8.3 Local Market Power for Make-Whole Payment Impact due to Reliability Constraints

**Conditions:** Any time a resource is scheduled as a result of a *reliability* constraint it will have met the condition for testing for local market power for make-whole payments.

**Resources Tested:** Any resource that is scheduled as a result of a *reliability* constraint will be tested for make-whole payment impact.

**Conduct Test:** The IESO will apply a conduct test to all resources identified above. The conduct test will identify, for these resources, all *dispatch data* values that violate the conduct test thresholds, which are listed in Table 3-19.

**Table 3-19: Make-Whole Payment Conduct Thresholds for Reliability Constraints**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer price is greater than 10% or \$25/MWh above reference level value; offers below \$25/MWh are excluded from economic withholding tests.</i>
Start-up offer	Start-up offer is greater than 10% above reference level
Speed no-load offer	Speed no-load offer is greater than 10% above reference level

**Impact Test:** Resources that failed the conduct test for *reliability* constraints will be subject to the impact test.

Table 3-20 describes the *reliability* constraint impact threshold (for make-whole payments) that the IESO will use.

**Table 3-20: Make-Whole Payment Impact Threshold for Reliability Constraints**

Dispatch Data	Threshold
Reliability Constraint	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is higher than the make-whole payment based on reference level values for parameters which failed the conduct test.

**Mitigation Application:** For any resource that fails the *reliability* constraint impact test for make-whole payments, the *IESO* will re-calculate the make-whole payment using the reference levels for those *dispatch data* parameters that were outside of the allowed conduct thresholds.

### 3.8.4 Global Market Power for Make-Whole Payment Impact in the Energy Market

**Conditions:** When any of the following conditions are met, the *IESO* will carry out the conduct and impact tests for make-whole payment impact for global market power:

- Any resource that was tested for global market power for price impact but was not mitigated and would otherwise receive a make-whole payment; or
- Any NQS resource that was committed in the *pre-dispatch scheduling* process and is otherwise receiving an unmitigated make-whole payment for that commitment that exceeds \$10,000.

**Resources Tested:** The set of resources that meet either of the two conditions above will be tested for make-whole payment impact.<sup>7</sup>

**Conduct Test:** The *IESO* will apply a conduct test to all resources identified above and determine the resources with *dispatch data* parameters that violate the conduct test thresholds as listed in Table 3-21.

**Table 3-21: Make-Whole Payment Conduct Thresholds for Global Market Power - Energy**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer</i> price is greater than either 200% or \$100/MWh above reference level value; <i>offers</i> below \$25/MWh are excluded from economic withholding tests.
Start-up offer	Start-up offer is greater than 100% above reference level
Speed no-load offer	Speed no-load offer is greater than 100% above reference level

**Impact Test:** Resources that are being tested for global market power and have *offered* outside their conduct thresholds will be subject to the impact test.

Table 3-22 describes the global market power impact threshold that will be used for make-whole payments.

<sup>7</sup> The decision to mitigate resources that were tested ex-ante for price impact will mean that the calculation of any make-whole payment amount will be done based on mitigated parameter values so it is not necessary to mitigate the make-whole payment separately in these cases. Only when resources were tested for mitigation for price impact but were not mitigated for price impact do resources need to be tested for make-whole payment in addition to the price impact testing.

**Table 3-22: Make-Whole Payment Impact Threshold for Global Market Power - Energy**

Dispatch Data	Threshold
Global ( <i>Energy</i> )	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offers</i> parameters which failed the conduct test.

**Mitigation Application:** For any resource that fails the impact test for make-whole payments, the *IESO* will re-calculate the make-whole payment using the reference levels for those *dispatch data* parameters that were outside of the allowed conduct thresholds.

### 3.8.5 Local Market Power for Make-Whole Payment Impact in the Operating Reserve Market

The *IESO* will apply the following process to identify and mitigate the make-whole payment impact for resources that have the potential to exercise local market power in the *operating reserve market*.

**Conditions:** For any resource that meets all of the following conditions the *IESO* will carry out the conduct and impact tests for make-whole payment impact for local market power in the *operating reserve market*:

- The resource was tested for local market power for *operating reserve* price impact;
- The resource would otherwise receive a make-whole payment; and
- The resource is scheduled to provide *operating reserve*.

**Resources Tested:** All resources that meet the conditions for local market power mitigation for a specific class of *operating reserve* will be tested.

**Conduct Test:** The *IESO* will apply a conduct test to all resources identified by the conditions listed above.

Table 3-23 lists the conduct thresholds that will be applied for these resources.

**Table 3-23: Make-Whole Payment Conduct Thresholds for Local Market Power – Operating Reserve**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	<i>Offer</i> price is greater than either 10% or \$25/MW above reference level value; <i>offers</i> below \$5/MW are excluded from economic withholding tests.
Speed no-load <i>offer</i>	Speed no-load offer is greater than 10% above reference level.
Start-up <i>offer</i>	Start-up offer is greater than 10% above reference level.
<i>Energy offers</i> for the range of production up to MLP	<i>Offer</i> price is greater than 10% or \$25/MWh above reference level value; <i>offers</i> below \$25/MWh are excluded from economic withholding tests.

**Impact Test:** The impact test will fail if the make-whole payment calculated with the *dispatch data* used to set schedules and prices is greater than the one calculated using the reference level values by more than the applicable make-whole payment impact threshold.

Table 3-24 lists the impact thresholds that will be applied for make-whole payment impact in local market power for *operating reserve*.

**Table 3-24: Make-Whole Payment Impact Threshold for Local Market Power – Operating Reserve**

Dispatch Data	Threshold
Local ( <i>operating reserve</i> )	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is higher than the make-whole payment based on reference level values for parameters that failed the conduct test.

**Mitigation Application:** To mitigate the resources that failed the impact test, the *IESO* will calculate its make-whole payment using the reference levels for those *dispatch data* values that were outside of the allowed conduct thresholds.

### 3.8.6 Global Market Power for Make-Whole Payment Impact in the Operating Reserve Market

Similar to the ex-ante mitigation process for price impact, the *IESO* will perform an assessment to check for exercises of global market power and test make-whole payments for mitigation.

**Conditions:** Any resource that meets either of the following conditions will be tested for *settlement* mitigation for make-whole payments:

- The resource was tested for global market power for *operating reserve* price impact, is scheduled to provide *operating reserve* and is receiving a make-whole payment, or
- An NQS resource is committed and scheduled to provide *operating reserve*, and would otherwise receive an unmitigated make-whole payment for that commitment that exceeds \$10,000.

**Resources Tested:** All resources that meet the conditions for global market power mitigation for a specific class of *operating reserve* will be tested for mitigation.

**Conduct Test:** The *IESO* will apply a conduct test to all resources identified by the conditions listed above. Table 3-25 lists the thresholds that will be applied.

**Table 3-25: Make-Whole Payment Conduct Thresholds for Global Market Power – Operating Reserve**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	<i>Offer</i> price is greater than either 50% or \$25/MW above reference level value; <i>offers</i> below \$5/MW are excluded from economic withholding tests.
Speed no-load <i>offer</i>	Speed no-load <i>offer</i> is greater than 25% above reference level.
Start-up <i>offer</i>	Start-up <i>offer</i> is greater than 25% above reference level
<i>Energy offers</i> for the range of production up to MLP	<i>Offer</i> price is greater than either 50% or \$25/MWh above reference level value; <i>offers</i> below \$25/MWh are excluded from economic withholding tests.

**Impact Test:** A resource will fail the make-whole payment impact test if the make-whole payment calculated using the the *dispatch data* used to set schedules and prices is greater than the one calculated using the reference level values by more than the relevant impact threshold.

**Table 3-26: Make-Whole Payment Impact Threshold for Global Market Power – Operating Reserve**

Dispatch Data	Threshold
Global ( <i>operating reserve</i> )	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offers</i> parameters which failed the conduct test.

**Mitigation Application:** For any resource that is tested for make-whole payment impact for global market power for *operating reserve* and fails the impact test, the *IESO* will calculate its make-whole payment using the reference levels for those *dispatch data* parameters that were outside of the allowed conduct thresholds.

### 3.9 Ex-Post Mitigation for Physical Withholding

Physical withholding refers to the exercise of market power when a *market participant* refrains from offering *energy* or *operating reserve* that is otherwise available. Similar to the mitigation process that will be followed for addressing economic withholding, the *IESO* will follow the conduct and impact methodology to address physical withholding. However, the mitigation process for physical withholding does differ in a few ways:

1. The *IESO* will test resources that meet the conditions for testing for physical withholding ex-post. Therefore, *offer* quantities will not be changed before *market prices* and schedules are determined.
2. The *IESO*, in consultation with *market participants*, will determine reference quantities that are estimates of the quantity of *energy* or *operating reserve* that the *market participant* would have offered had competition not been restricted. Section 3.14 provides information on the processes that will be used to register reference quantities.
3. The *IESO* will use these reference quantities in the same way as it will use reference levels. *Market participants* will be able to make representations following the initial conduct and impact tests and prior to any settlement charge being issued if they disagree with the reference quantity used in the tests.
4. If any *market participant* fails both the conduct and impact tests, then the *market participant* may be subject to a *settlement* charge as discussed below.

#### 3.9.1 Consultation with Market Participants on Reference Quantity

The *IESO* will carry out the conduct and impact tests using the reference quantity. The initial test results will provide an indicative finding and will not be determinative. If any resource fails the initial conduct and impact tests, the *IESO* will notify the *market participant* of the indicative finding and allow them 15 *business days* to provide relevant supplementary information regarding the reference quantity.

Relevant supplementary information could include information regarding factors such as ambient temperature, humidity, water flow conditions and other resource-specific considerations that the participant believes were not accounted for in the registered reference quantity.

If the information provided by the *market participant* changes the reference quantity that the *IESO* had used in the initial conduct and impact tests the *IESO* will re-run the conduct and impact tests. If the re-run still results in a failure of the conduct and impact tests, that revised finding will be used to determine a *settlement* charge.

### 3.9.2 Using Market Control Entities in the Mitigation Process

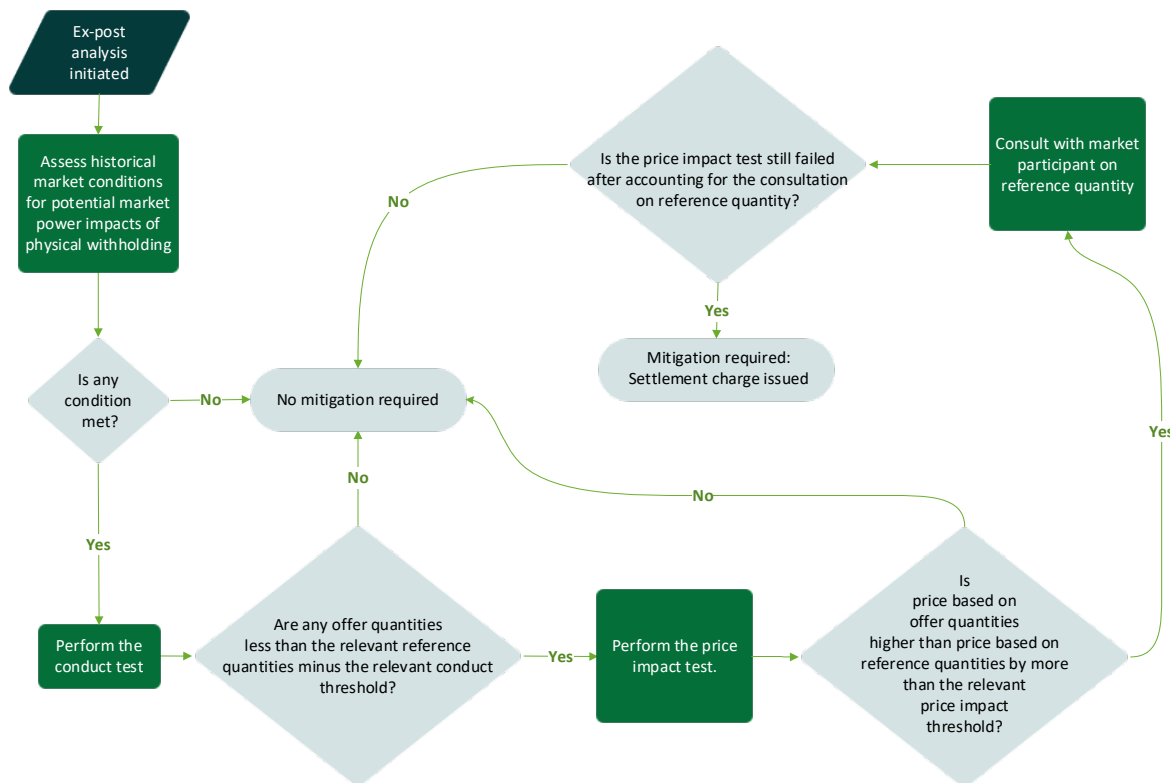
A market control entity refers to a person or an entity who can affect the participation of a *market participant's* resource in the *IESO-administered markets*. The Authorization and Participation and Facility Registration detailed design documents provide more detail on market control entities.

When the *IESO* assesses physical withholding, it will carry out a conduct test on the basis of both the individual resource and of the relevant market control entity. A *market participant* will be deemed the market control entity of its own resource where no other person or persons qualify.

For the purposes of performing the physical withholding assessments, affiliates with a voting interest of greater than fifty percent will be deemed to be the market control entity for that resource.

### 3.9.3 Mitigation for Physical Withholding in the Energy Market

Similar to testing for economic withholding, the *IESO* will test for physical withholding only when competition is restricted in the *energy* market.



**Figure 3-6: Conduct and Impact Testing Methodology for Physical Withholding**

**Conditions:** The *IESO* will consider the following resources to be eligible for testing for physical withholding:

- Resources that have an LMP greater than \$25/MWh and an installed capacity of at least 10 MW; and
- Resources that have an LMP greater than \$25/MWh and the market control entity for each resource has at least 10 MW in aggregate installed capacity.

In order to be tested for physical withholding, the above-mentioned resources must meet at least one of the following conditions:

- The resource is a part of an NCA or a DCA where at least one of the transmission constraints that defines that NCA or the DCA is binding, including resources that did not submit any *offers*; or
- The resource has a positive congestion component greater than a threshold value of \$25/MWh, including resources that did not submit any *offers*; or
- The resource can meet incremental load within Ontario when the conditions for testing for global market power for *energy* price impact are met. The list of eligible resources includes resources that did not submit any *offers*.

**Resources Tested:** The *IESO* may apply the conduct test for physical withholding of *energy* to any resource that meets any of the conditions discussed in the previous section.

**Conduct Test:** The *IESO* may apply a conduct test for all resources identified in the section above.

The test for physical withholding will only test for a price impact. It will not test for a make-whole payment impact because the *IESO* does not provide make-whole payments for unoffered supply. The *IESO* will test for market power related to make-whole payments through the economic withholding tests, as appropriate.

Table 3-27 lists the conduct thresholds that the *IESO* will use when testing for physical withholding of *energy*.

**Table 3-27: Conduct Thresholds for Physical Withholding – Energy**

Dispatch Data	Threshold
Global ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Submitting <i>energy offers</i> of quantities that are lower than either 10% or 100 MW below a resource's reference quantity.</li> <li>• For at least two resources from one market control entity, submitting <i>energy offers</i> of quantities that are in the aggregate, lower than either 5% or 200 MW below the resources' aggregate reference quantities.</li> </ul>
BCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Submitting <i>energy offers</i> of quantities that are lower than either 10% or 100 MW below a resource's reference quantity.</li> <li>• For at least two resources from one market control entity, submitting <i>energy offers</i> of quantities that are in the aggregate, lower than either 5% or 200 MW below the resources' aggregate reference quantities.</li> </ul>
NCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Submitting <i>energy offers</i> of quantities that are lower than either 2% or 5 MW below a resource's reference quantity.</li> <li>• For at least two resources from one market control entity, submitting <i>energy offers</i> of quantities that are in the aggregate, lower than 5 MW below the resources' aggregate reference quantities.</li> </ul>
DCA ( <i>Energy</i> )	<ul style="list-style-type: none"> <li>• Submitting <i>energy offers</i> of quantities that are lower than either 2% or 5 MW below a resource's reference quantity.</li> <li>• For at least two resources from one market control entity, submitting <i>energy offers</i> of quantities that are in the aggregate, lower than 5 MW below the resources' aggregate reference quantities.</li> </ul>

**Ex-Post Market Simulation:** The *IESO* cannot schedule or *dispatch* unoffered supply. Therefore, testing for physical withholding can only be done after-the-fact. The *IESO* will need to perform its ex-post analysis of market impact by running market simulations.



**Impact Test:** The *IESO* may perform the impact test for physical withholding on resources that meet all the conditions described above and fail any of the conduct tests. Table 3-28 describes the physical withholding price impact thresholds that will be applied for *energy*.

**Table 3-28: Price Impact Thresholds for Physical Withholding– Energy**

Dispatch Data	Threshold
Global ( <i>Energy</i> )	As-offered <i>energy</i> LMP is 100% or \$50/MWh above the reference quantity <i>energy</i> LMP.
BCA ( <i>Energy</i> )	Same as the impact threshold for Global conditions.
NCA ( <i>Energy</i> )	As-offered <i>energy</i> LMP is 50% or \$25/MWh above the reference quantity <i>energy</i> LMP.
DCA ( <i>Energy</i> )	Same as the impact threshold for NCA conditions.

**Mitigation Application:** If a *market participant* fails the conduct and impact tests for physical withholding, that *market participant* will be subject to a *settlement* charge for each instance of physical withholding. An instance of physical withholding is defined as a single *dispatch day* on which physical withholding is found to occur per market control entity.

This *settlement* charge will be the base *settlement* charge adjusted by a persistence multiplier as described below.

**Base Settlement Charge:** The base *settlement* charge will be calculated using the MW quantity for each hour in the day-ahead market, or interval for the *real-time market*, that failed the conduct and impact tests for physical withholding for a *dispatch day* multiplied by 1.5.

**Day-Ahead:** In the day-ahead market, the MWs of *energy* withheld by a resource for each hour of the *dispatch day* will be the total hourly quantity that failed the conduct and impact tests for physical withholding from the DAM. The price used will be the resource’s day-ahead market LMP for each hour. The quantity that failed the conduct and impact tests in each hour will be multiplied by the corresponding hourly price and by 1.5 to yield a base *settlement* charge for the hour.

The day-ahead base *settlement* charge for a *dispatch day* is the sum of the base *settlement* charges across all hours of the *dispatch day* for which the conduct and impact tests was failed.

**Real-Time:** In the *real-time market*, the MWs of *energy* withheld for each interval of the *dispatch day* will be the total quantity per interval that failed the conduct and impact tests for physical withholding from the *real-time market*. The price used will be the resource’s *real-time market* LMP for each interval. The quantity that failed the conduct and impact tests in each interval will be multiplied by the corresponding real-time price and by 1.5 to yield a base to yield a *settlement* charge for the interval.

The real-time base *settlement* charge for a *dispatch day* is the sum of *settlement* charges across all intervals of the *dispatch day* for which the conduct and impact tests was failed.

**Day-Ahead and Real-Time:** If a resource fails the conduct and impact tests for a *dispatch hour* in both the day-ahead market and the *real-time market*, the *IESO* will determine the day-ahead base *settlement* charge and the real-time base *settlement* charge for that *dispatch hour* and will levy the higher of these two base *settlement* charges.



### 3.9.3.1 Persistence Multiplier for Physical Withholding Settlement Charges

The base *settlement* charge will be multiplied by the relevant persistence multiplier to determine the applicable *settlement* charge.

The persistence multiplier is conditioned on repeat failures by a market control entity of the conduct and impact tests for physical withholding.

The following table describes the persistence multiplier that will be applied to the base *settlement* charge.

**Table 3-29: Persistence Multipliers**

Persistence Multipliers	
First instance of physical withholding by a market control entity within an 18-month period.	1
Second instance of physical withholding by a market control entity within an 18-month period.	2
Third, and additional, instances of physical withholding by a market control entity within an 18-month period.	3

### 3.9.4 Mitigation for Physical Withholding in the Operating Reserves Market

The *IESO* will also test market conditions for the exercise of market power through physical withholding in the *operating reserve market*.

The different classes of *operating reserve offers* that will be considered in both the scheduling and the mitigation processes are described in Section 3.6.2.

**Conditions:** The *IESO* will consider the following resources to be eligible for testing for physical withholding in the *operating reserve market*:

- Resources that have an *operating reserve* LMP greater than \$5/MW and an installed capacity of at least 10 MW; or
- Resources that have an *operating reserve* LMP greater than \$5/MW and the market control entity for each resource has at least 10 MW in aggregate installed capacity.

In order to be tested for physical withholding, the above-mentioned resources must meet at least one of the following conditions:

- If the unmitigated price of a class of *operating reserve* exceeds \$15/MW, all resources eligible to provide that class of *operating reserve* will be tested for physical withholding; or
- If the value of a MIN constraint for a reserve area is greater than 0 MW for a class of reserve for that particular reserve area, all resources eligible to provide that class of *operating reserve* in that reserve area will be tested for physical withholding.

Resources within a region in which incremental *operating reserve* of a given class could not be scheduled due to a MAX area reserve constraint will not be tested for physical withholding.

**Resources Tested:** The *IESO* may apply the conduct tests for physical withholding of *operating reserve* for any resource that meets any of the conditions discussed in the previous section.

**Conduct Test:** The *IESO* may apply a conduct test for all resources identified in the preceding section.

The test for physical withholding only tests for a price impact, it will not test for a make-whole payment impact because the *IESO* does not provide make-whole payments for unoffered supply. The *IESO* will test for market power related to make-whole payments through the economic withholding tests, as appropriate.

Table 3-30 lists the conduct thresholds that the *IESO* will use when testing for physical withholding of *operating reserve*.

**Table 3-30: Conduct Thresholds for Physical Withholding – Operating Reserve**

Dispatch Data	Threshold
Global ( <i>operating reserve</i> )	<ul style="list-style-type: none"> <li>Submitting <i>operating reserve offers</i> of quantities that are lower than either 10% or 100 MW below a resource's reference quantity.</li> <li>For at least two resources from one market control entity, submitting <i>operating reserve offers</i> of quantities that are in the aggregate, lower than either 5% or 200 MW below the resources' aggregate reference quantities.</li> </ul>
Local ( <i>operating reserve</i> )	<ul style="list-style-type: none"> <li>Submitting <i>operating reserve offers</i> of quantities that are lower than either 2% or 5 MW below a resource's reference quantity.</li> <li>For at least two resources from one market control entity, submitting <i>operating reserve offers</i> of quantities that are in the aggregate, lower than 5 MW below the resources' aggregate reference quantities.</li> </ul>

**Ex-Post Market Simulation:** The *IESO* will need to perform its ex-post analysis of market impact by running market simulations. The *IESO* will use the same approach for running market simulations for testing physical withholding for *operating reserve* as it does for *energy*.

**Impact Test:** Table 3-31 lists the physical withholding price impact thresholds that will be applied for *operating reserve*.

**Table 3-31: Price Impact Thresholds for Physical Withholding - Operating Reserve**

Dispatch Data	Threshold
Global ( <i>operating reserve</i> )	As-offered <i>operating reserve LMP</i> is 50% or \$25/MW above the reference quantity <i>operating reserve LMP</i> .
Local ( <i>operating reserve</i> )	As-offered <i>operating reserve LMP</i> is above the reference quantity <i>operating reserve LMP</i> .

**Mitigation Application:** When the conduct and impact tests are failed for physical withholding of *operating reserve*, the result will be a *settlement* charge. This *settlement* charge will be determined in the same manner as mitigation application for physical withholding in the *energy* market.

### 3.10 Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties

The *IESO* will test for economic withholding at uncompetitive *interties* on an ex-post basis in the day-ahead market and the *real-time market*. Because the economic withholding analysis will be ex-post, *dispatch data* parameters at uncompetitive *interties* will not be changed before *market prices* or make-whole payments are determined. Section 3.12.5 describes the criteria that the *IESO* will use for designating an *intertie* as uncompetitive.

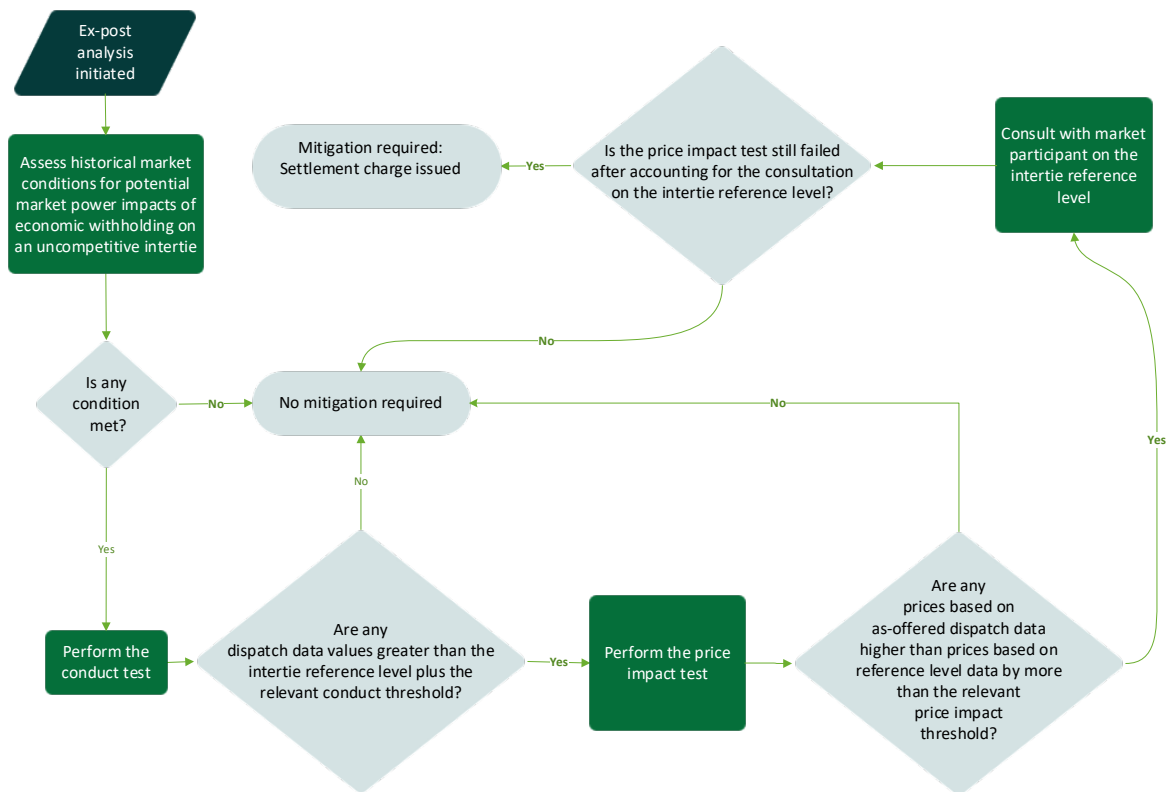
*Market participants* offering or bidding for *energy*, or offering *operating reserve* on an uncompetitive *intertie* will be eligible to be tested for economic withholding on an ex-post basis.

The *IESO* will perform an ex-post assessment to check for specific conditions at uncompetitive *interties*. If these conditions are met, the *IESO* will apply the conduct and impact tests on *market participant bids* and *offers* to test for economic withholding on those *interties*. If the conduct and impact tests are failed, the *IESO* will apply a *settlement charge*.

The *IESO* will use either the *offer*-based reference price or the *intertie* border price (IBP) as the *intertie* reference level for the conduct and impact tests for both *energy* and *operating reserve* market. Section 3.13.1 describes in detail how the *IESO* will determine these *intertie* reference levels.

The *IESO* will perform its ex-post analysis of market impact by running market simulations. The *IESO* will test to see if prices or make-whole payments for transactions on uncompetitive *interties* were materially impacted by *energy offers*, *energy bids* or *operating reserve offers* of prices significantly higher than the relevant *intertie* reference level.

Figure 3-7 illustrates the ex-post mitigation process that will be implemented by the *IESO* to test for economic withholding on uncompetitive *interties*.



**Figure 3-7: Conduct and Impact Testing Methodology for Economic Withholding on Uncompetitive Interties**

### 3.10.1 Intertie Reference Level

In order to carry out the conduct and impact tests, the *IESO* will determine an *intertie* reference level. This is an estimate for the price for *energy* or *operating reserve* that the *market participant* would have *offered* or *bid* on the uncompetitive *intertie* if competition had not been restricted.

The *intertie* reference level will be determined the basis of *boundary entity* resources. Each *intertie* contains a number of *boundary entity* resources. When *market participants* submit an import *offer* or *export bid* on an *intertie*, they select a *boundary entity* resource on that *intertie* for each *offer* or *bid*.

When a *boundary entity* resource has been scheduled economically by the *IESO* for at least 15 of the 90 days previous to the dispatch day being investigated, the *intertie* reference level will be the offer-based reference price (described below). If this condition is not met, the *intertie* reference level will instead be the *intertie* border price (IBP) for *energy* or *operating reserve*. The IBP is the *intertie* price that does not take into account *intertie* congestion.

### 3.10.1.1 Offer-Based Reference Price

The offer-based reference price for *energy* for uncompetitive *interties* shall be the unweighted average of the price contained in all *energy offers* or *bids* submitted recently by the *market participant* for that *boundary entity* resource and scheduled economically by the *IESO*.

The offer-based reference price shall be the initial estimate for an *offer* or *bid* under competitive conditions. However, *market participants* will have the opportunity to provide relevant information that the *IESO* will consider when determining any resulting *settlement* charges.

### 3.10.2 Using Reference Levels in the Mitigation Process for Uncompetitive Interties

When assessing economic withholding on uncompetitive *interties*, the *IESO* will use the *intertie* reference level in a manner similar to how reference quantities are used in the tests for physical withholding. This includes providing *market participants* with the ability to make representations regarding the value of the *intertie* reference level.

The *IESO* will carry out the conduct and impact tests using the *intertie* reference level. The initial test results will provide an indicative finding and will not be determinative. If any *market participant* on an uncompetitive *intertie* resource fails the conduct and impact tests, the *IESO* will notify the *market participant* of the indicative finding and allow them 15 *business days* to make representations regarding the *intertie* reference level.

If the information provided by the *market participant* changes the *intertie* reference level, the *IESO* will re-run the conduct and impact tests. If the re-run still results in a failure of the conduct and impact tests, that revised finding will be used to determine a *settlement* charge.

### 3.10.3 Ex-Post Market Simulation

The *IESO* will consider *market participant* input when determining the appropriate *intertie* reference level. Therefore, testing for economic withholding on uncompetitive *interties* can only be done after-the-fact. The *IESO* will perform its ex-post analysis of market impact by running market simulations.

### 3.10.4 Mitigation for Operating Reserve Price Impact on Uncompetitive Interties

**Conditions:** If there is an *operating reserve* price for a class of *operating reserves* on an uncompetitive *intertie* greater than a threshold value of \$15/MW, *offers* to import *operating reserve* of this class on the *intertie* will be eligible for ex-post testing for *operating reserve* price impact on an uncompetitive *intertie*.

**Resources Tested:** The *IESO* may apply the conduct tests for economic withholding of *operating reserve* for any *market participant* submitting an *operating reserve* import *offer* on an uncompetitive *intertie* that meets the condition discussed in the previous section.

**Conduct Test:** The *IESO* may apply a conduct test for all *operating reserve* import offers identified in the section above.

When the IESO applies the conduct test, it will determine if *operating reserve* import offers fail the conduct tests.

**Table 3-32** lists the conduct thresholds that the IESO will use when testing for price impact for *operating reserve* on an uncompetitive *intertie*.

**Table 3-32: Conduct Threshold for Price Impact Testing at Uncompetitive Interties – Operating Reserve**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	<i>Offer price is greater than either 50% or \$25/MW above reference level value; offers below \$5/MW are excluded from economic withholding tests.</i>

**Impact Test:** Resources that fail the conduct test will be subject to an impact test. Table 3-33 describes the economic withholding impact thresholds that will be applied to test for price impact on uncompetitive *interties* for *operating reserve*.

**Table 3-33: Price Impact Threshold at Uncompetitive Interties – Operating Reserve**

Operating Reserve Price Impact Thresholds	
Uncompetitive Interties ( <i>operating reserve</i> )	As-offered <i>operating reserve</i> LMP is 50% or \$25/MW above the <i>intertie</i> reference level <i>operating reserve</i> LMP.

**Mitigation Application:** If a *market participant* fails the conduct and impact tests for economic withholding on an uncompetitive *intertie*, that participant will be subject to a *settlement* charge.

The IESO will issue a *settlement* charge for each instance of economic withholding. An instance of economic withholding is defined as a single *dispatch day* on which economic withholding is found to occur on an uncompetitive *intertie* per *market participant*.

This *settlement* charge will be calculated using the hourly MW quantity that failed the conduct and impact test for economic withholding for a *dispatch day*.

This *settlement* charge for *operating reserve* price impact on an uncompetitive *intertie* will be calculated for the day-ahead market and the *real-time market*. Make-whole payment impact will also be assessed in both the day-ahead market and the *real-time market*.

The quantity of *operating reserve* for the *settlement* charge will be the total quantity of *operating reserve* on any uncompetitive *intertie* that failed the conduct and impact test for a price impact across all hours of the *dispatch day*.

This *settlement* charge will be the relevant *operating reserve* quantity multiplied by the *operating reserve* LMP during the relevant hour, totaled for the entire *dispatch day*.

### 3.10.5 Mitigation for Make-Whole Payment Impact on Uncompetitive Interties

**Conditions:** If a resource meets any one of the following conditions, that resource will be eligible for ex-post testing for make-whole payment impact on an uncompetitive *intertie*:

- The resource was tested for an *energy* price impact on an uncompetitive *intertie*; or
  - The resource was tested for an *operating reserve* price impact on an uncompetitive *intertie*;
- or

- The resource was scheduled to provide *operating reserve* on an uncompetitive *intertie* and received a make-whole payment greater than \$10,000.

**Resources Tested:** The *IESO* may apply the conduct tests for economic withholding for any *market participant* that meets any of the conditions discussed in the previous section.

**Conduct Test:** When the *IESO* applies the conduct test, it will determine if *energy* or *operating reserve* import *offers* fail the conduct tests.

Table 3-34 lists the conduct thresholds that the *IESO* will use when testing for make-whole payment impact on an uncompetitive *intertie*.

**Table 3-34: Make-Whole Payment Conduct Thresholds at Uncompetitive Interties**

Dispatch Data	Threshold
<i>Operating reserve offer</i>	<i>Offer price</i> is greater than either 50% or \$25/MW above reference level value.
<i>Energy offer</i>	<i>Offer price</i> is greater than either 200% or \$100/MWh above reference level value.

**Impact Test:** The *IESO* may perform the impact test for all *energy* import *offers* and *operating reserve* import *offers* that meet the conditions identified in the section above and that fail the conduct test.

The impact threshold that will be applied will be the impact threshold explicitly associated with make-whole payment testing on uncompetitive *interties* listed in Table 3-35.

**Table 3-35: Make-Whole Payment Impact Threshold at Uncompetitive Interties**

Make-Whole Payments Impact Thresholds	
Uncompetitive Interties	Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offer</i> parameters which failed the conduct test.

**Mitigation Application:** When the conduct and impact tests are failed for make-whole payment impact on an uncompetitive *intertie*, a *settlement* charge may be issued. Make-whole payment impact will be assessed in both the day-ahead market and the real-time market.

The *IESO* will determine the make-whole payment that would have occurred had the offer-based reference price been used.

This *settlement* charge will be the difference between the make-whole payment for a given transaction and the make-whole payment that would have occurred had the *intertie* reference price been used.

### 3.10.6 Mitigation for Energy Price Impact on Uncompetitive Interties

**Conditions:** The resource will be eligible for ex-post testing for *energy* price impact on an uncompetitive *intertie* if:

- There is a positive congestion component for *energy* on an uncompetitive *intertie* greater than a threshold value of \$25/MWh; and
- The *energy offer* or *bid* price is above \$25/MWh.

**Note:** The congestion referred to in this section does not relate to *inertie* congestion.

**Resources Tested:** The *IESO* may apply a conduct test for any *market participant* submitting an *energy offer* or *bid* on an uncompetitive *inertie* that meets the condition in the previous section.

**Conduct Test:** The *IESO* may apply a conduct test for all *energy import offers* or *export bids* identified in the previous section to determine if they fail the conduct tests.

**Table 3-36: Conduct Threshold for Price Impact Testing at Uncompetitive Interties - Energy**

Dispatch Data	Threshold
<i>Energy offer</i>	<i>Offer or bid</i> price is greater than either 200% or \$100/MWh above reference level value; <i>offers</i> and <i>bids</i> below \$25/MWh are excluded from economic withholding tests.

**Impact Test:** The *IESO* may perform the impact test for all *energy import offers* or *bids* that meet the conditions identified in the section above and that fail the conduct test. 3-29 describes the economic withholding impact thresholds that will be applied to test for price impact on uncompetitive *interties* for *energy*.

**Table 3-37: Price Impact Threshold at Uncompetitive Interties – Energy**

Energy Price Impact Thresholds	
Uncompetitive Interties ( <i>Energy offer</i> )	As-offered <i>energy LMP</i> is 100% or \$50/MWh above the <i>inertie</i> reference level <i>energy LMP</i> .

**Mitigation Application:** If a *market participant* fails the conduct and impact tests for economic withholding on an uncompetitive *inertie*, that participant will be subject to a *settlement* charge.

The *IESO* will determine this *settlement* charge for each instance of economic withholding. An instance of economic withholding on an uncompetitive *inertie* is defined as a single *dispatch day* on which economic withholding is found to occur on an uncompetitive *inertie* per *market participant*.

This *settlement* charge shall be calculated using the MWh quantity that failed the conduct and impact test for economic withholding for a *dispatch day*.

This *settlement* charge for *energy* price impact on an uncompetitive *inertie* will be calculated for both the day-ahead market and the *real-time market*.

The quantity of MWhs for the *settlement* charge will be the total MWh quantity on any uncompetitive *inertie* that failed the conduct and impact test for a price impact across all hours of the *dispatch day*.

This *settlement* charge will be the relevant MWhs quantity multiplied by the *energy LMP* at the *inertie* during the relevant hour, totaled for the entire *dispatch day*.

### 3.11 Ex-Post Mitigation: Procedural Steps

When the *IESO* identifies an instance of either economic withholding at an uncompetitive *inertie* or of physical withholding, it will apply the conduct and impact tests to determine if a *settlement* charge is warranted under the ex-post mitigation framework. If the *IESO* determines that a *settlement* charge should be applied, the following procedure will be implemented:

1. The *IESO* will notify the registered *market participant* of the *settlement* charge no later than six months after an instance of either physical withholding or economic withholding on an uncompetitive *inertie*.
2. This notice will include an estimate of the *settlement* charge.



3. Within 15 business days of receiving the notification, the registered *market participant* may make written representations regarding the reference quantity or *intertie* reference level used to determine the settlement charge.
4. Within three months after the time period specified in the previous step has elapsed, the *IESO* shall complete its analysis and notify the registered *market participant* whether it will impose a final settlement charge.

## 3.12 Designation of Constrained Areas and Uncompetitive Interties

The conditions for the exercise of market power can be created when competition is restricted in a localized area. This is referred to as local market power. Two conditions that can result in the potential for local market power are:

- **Load pockets:** Load pockets can be created when transmission constraints bind, leaving a reduced set of resources that can meet the load behind the transmission constraints. In some situations, a load pocket can be created when a single constraint binds, and in others, multiple transmission constraints can contribute to the formation of a load pocket. As a result of these constraints, locational marginal prices within a load pocket can be higher than elsewhere in the province or region; and
- **Reliability constraints:** Competition can also be restricted in circumstances when the *IESO* sets a commitment or schedule for a resource manually, which are known as *reliability* constraints.

Areas of the transmission system that are regularly impacted by binding transmission constraints and load pockets are known as constrained areas. Depending on how frequently the transmission constraints bind in an area, that area will be classified as one of the following: narrow constrained area (NCA), dynamic constrained area (DCA) or broad constrained area (BCA). Constraints defining the BCA bind infrequently while NCA or DCA constraints bind more frequently.

When testing resources for local market power, the *IESO* will use the set of conduct and impact thresholds that apply to the more restrictive constrained area. For example, a resource might meet the conditions for both BCA and NCA testing for local market power. Because competition is more restricted in an NCA, the *IESO* will use those thresholds to test for the exercise of market power.

Both binding transmission constraints and *reliability* constraints can increase the potential for local market power to exist. In the case of binding transmission constraints, the *IESO* will test the relevant resources for ex-ante price mitigation.

In the case of *reliability* constraints, the *IESO* will not test the constrained portion of these resource's schedules for ex-ante price impact mitigation. This is because minimum or maximum schedules from *reliability* constraints are not eligible to set price, and therefore, are not expected to impact price. Resources subject to *reliability* constraints will be tested for make-whole payment mitigation, described in Section 3.8.3.

### 3.12.1 Narrow Constrained Areas

Narrow constrained areas (NCAs) are areas where congestion is expected to be relatively frequent over a relatively long duration. Given the expected frequency when competition would be limited, price or make-whole payment increases above competitive levels could have a material impact on the cost of meeting load.



### 3.12.1.1 Designation Criteria

The *IESO* will assess NCA designations and publish the results on an annual basis. This assessment may result in the determination of a new NCA, the persistence of an existing NCA or the revocation of an NCA designation. NCA designations will apply in all the three timeframes of the *IESO-administered markets*: DAM, PD and RT

If the *IESO* has an expectation that a load pocket will be constrained in more than 4% of the hours in the following year in either the day-ahead market or the *real-time market*, the *IESO* may designate such a load pocket as an NCA.

The *IESO's* expectations of congestion will be informed by historical data from the previous year and prospective analysis predicting where congestion is expected to continue.

### 3.12.1.2 Identifying Resources Inside an NCA

For each NCA, the *IESO* will determine the resources that will be tested for mitigation when the relevant conditions for each NCA are met.

The amount of relief that a particular resource provides on a constraint is described by the GSF of that resource on that constraint to meet the load at the reference node. GSFs are denoted in decimal terms. A 0.02 GSF indicates that a 1 MW increase in injections at that resource to meet the load at the reference node results in a 0.02 MW relief of congestion on that constraint.

Any resource that has a GSF equal to or greater than 0.02 on any transmission constraint to meet the load at the reference node that defines an NCA will be a part of that NCA.

### 3.12.1.3 Publication

The *IESO* will publicly post a list of current NCAs, along with each of the resources that are included within each NCA.

The publication will also identify the transmission constraints that make up the NCA and include the results of the analysis that the *IESO* used to come to such a designation.

The *IESO* will publicly post this information about upcoming NCAs no later than 30 days prior to the date that such designations come into effect.

## 3.12.2 Dynamic Constrained Areas

There may be occasions when a transmission constraint binds or is expected to bind relatively frequently but not for a long enough duration to warrant the designation of an NCA. An example of this might be a transmission *outage* that results, or is expected to result, in increased congestion leading into a load pocket for a period of days. In such cases, these load pockets will be designated as a dynamic constrained area (DCA) for the duration the change in congestion conditions is expected to continue.

### 3.12.2.1 Designation Criteria

The *IESO* will determine the set of constrained areas of the transmission grid that meet any of the following conditions and may designate these as DCAs if:<sup>8</sup>

- The load pocket is import constrained in more than 15% of hours in a continuous five-day period prior to the current period in either the day-ahead market or the *real-time market*; or

<sup>8</sup> When analyzing congestion in the *real-time market*, the *IESO* will examine pre-dispatch and multi-interval optimization (MIO) scheduling results. If congestion patterns are significantly different in the pre-dispatch and

- The *IESO* identifies the prospective initiation of an *outage* or recurring conditions that previously caused a binding import constraint to a load pocket for at least 15% of hours in a continuous 5-day period in either the day-ahead market or the *real-time market*.

The *IESO* will revoke the designation of a DCA when the specific *outages* or other conditions that occurred causing the DCA designation have been resolved. DCA designations will apply in the day-ahead market, pre-dispatch scheduling process and real-time market.

### 3.12.2.2 Identifying Resources Inside a DCA

For each DCA, the *IESO* will determine the resources that will be tested for mitigation when the relevant conditions for each DCA are met.

Any resource that has a GSF equal to or greater than 0.02 on a transmission constraint to meet load at the reference node, where the transmission constraint defines a DCA, will be a part of that DCA.

### 3.12.2.3 Publication

The *IESO* will publicly post a list of current DCAs, along with each of the resources that are included within each DCA. The publication will also identify the transmission constraints that make up the DCA and include the results of the analysis that the *IESO* used to come to such a designation.

The *IESO* will publicly post this information about upcoming DCAs as quickly as reasonably possible because the conditions that lead to the designation of a DCA may not materialize until during or shortly before an *outage*. The *IESO* will indicate in the public posting when the DCA designation will come into effect.

### 3.12.3 BCA Constraints

Transmission constraints that are not NCA or DCA constraints may result in supply resources being dispatched up, relative to the reference location, in a specific area. The areas where such resources are located are collectively defined as the broad constrained area (BCA). Transmission constraints that create load pockets, which bind relatively infrequently, make up the BCA constraints.

The BCA exists any time one or more resources outside an NCA or a DCA are scheduled with a congestion component greater than \$25/MWh. It also exists anytime an NQS resource receiving a make-whole payment outside an NCA or a DCA is committed where it has a positive congestion component on a binding or active constraint.

Commitment of an NQS resource may not result in increased congestion even where they are attempting to exercise market power via very high start-up or speed no-load offers. The LMP at a resource is not directly impacted by start-up offers or speed no-load offers, so limiting testing for mitigation of NQS resources to positive congestion would potentially allow NQS resources to use other *dispatch data* parameters to exercise market power. In addition, when an NQS resource is committed, it can result in eliminating positive congestion as the MW quantity committed can be greater than the amount necessary to de-congest the constraint.

### 3.12.4 Reliability Constraints

There are specific situations where the system operator needs to manually set the schedule for, commit or *dispatch* a resource. These out-of-market actions are occasionally required in order to maintain the *reliability* of the *IESO-controlled grid*. In cases where a manual action by the *IESO*

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MIO scheduling timeframes, then the *IESO* will look at both of these timeframes when determining if the designation criteria are met for a given constrained area.

directly impacts the schedule for a resource, schedules are not derived as a result of a competitive process. In such situations, competitive pressures are very restricted.

These cases are referred to in this document as *reliability* constraints. Eligible situations when the schedule is manually set by the *IESO* are occasions when the *IESO* sets a minimum, maximum or a fixed constraint on a resource. Minimum and fixed constraints have the potential to affect lost-cost make-whole payments when a resource is manually scheduled even though its cost may be higher than the LMP.

### 3.12.4.1 Reliability Constraints: Commitments

Any commitment of an NQS resource that is not the result of economic selection by a calculation engine, is considered to be a *reliability* constraint. In these cases, the commitment of the NQS resource is not the result of a robust competitive process and competition will be significantly restricted when the resources are selected.

### 3.12.4.2 Reliability Constraints: Manually Set Schedules

The *IESO* will maintain a list of manual constraint types that will be excluded from mitigation for *reliability* constraints.

Barring the types of manual constraints excluded below, whenever the schedule of a resource is manually set by the *IESO*, it will be classed as a *reliability* constraint.

Manual constraints include constraints to bring online NQS resources that are not eligible for the day-ahead or real-time generator offer guarantee.

The following manual constraints are excluded from *reliability* constraints for the purpose of mitigation:

- If the *IESO* sets a participant's schedule to address a gap in the *IESO*'s tools or processes, and the manual processes followed by the *IESO* includes a proxy for economic selection in the scheduling process. For example, resources scheduled for *operating reserve* that have their respective *energy* schedules selected in the event of a contingency are excluded. Although these resources are selected by a manual action by the *IESO*, the process to select the relevant resources includes consideration of the economics of the available *energy offers* that could potentially be selected.
- When the *IESO* manually sets schedules due to the *IESO* tool failures. These occasions are likely not predictable, which reduces the risk that behaviour during these occasions represents attempts to exercise market power.

### 3.12.5 Designation of Uncompetitive Interties

The *IESO* will designate *interties* where competition is restricted as uncompetitive *interties* and will apply mitigation measures at these uncompetitive *interties*. The *IESO* will not apply mitigation measures at *interties* that have not been designated as uncompetitive.

*Interties* will be designated as uncompetitive if they meet specific criteria that the following section describes. The designated *interties* will be publicly identified on the *IESO* website. The *IESO* will review the designations of uncompetitive *interties* on an ongoing basis and modify them as appropriate.

An *intertie* will be designated as uncompetitive when any one of the following conditions is true:

- An *intertie* where at least ninety percent of the day-ahead scheduled withdrawals or injections over that *intertie* in the ninety days prior to such an evaluation have been accounted for by one market control entity; or
- An *intertie* where the *IESO* finds grounds to believe that effective competition for the supply of imports or demand for exports is or is expected to be restricted.

### 3.12.5.1 Revocation of Designation of Uncompetitive Interties

If an *intertie* no longer meets the criteria that led to its uncompetitive designation, the *IESO* may revoke such designation. However, if there are grounds to expect that the *intertie* conditions might meet these criteria once again in the near future, the *IESO* may elect not to revoke the uncompetitive *intertie* designation.

## 3.13 Reference Levels

### 3.13.1 Reference Level Methodology for Financial Dispatch Data Parameters

The *IESO* will determine reference levels for financial *dispatch data* parameters using a cost-based methodology. A cost-based methodology uses data submitted to the *IESO* by *market participants* to establish an approximation of each resource's short-run marginal costs. Short-run marginal costs are costs that are incurred only if the resource operates and are not incurred otherwise.

The *IESO* will calculate reference levels using this methodology for the following costs:

- *Energy* reference level. The short-run marginal costs associated with the supply of incremental injections of *energy* into the *IESO-controlled grid*;
- Speed no-load reference level. The short-run marginal costs associated with operating a *generation unit* in a synchronized status while injecting no *energy* to the *IESO-controlled grid*;
- Start-up reference level. The short-run marginal costs associated with bringing an offline resource through all the *generation unit*-specific start-up procedures to *minimum loading point*; and
- *Operating reserve* reference level. The short-run marginal costs associated with preparing a resource to be able to supply incremental injections of *energy* into the *IESO-controlled grid* per the requirements for a class of reserves.

Long-term costs necessary to keep the resource in service and available are not included in the *energy* or *operating reserve* market reference levels.

For an *energy offer*, the *IESO* will establish an *energy offer* reference level curve for each set of *dispatch data* values. This will include up to 20 non-decreasing values of the *energy* reference level to form a monotonically increasing cost curve. This *energy* reference level curve will be used for the conduct and impact testing of the *price quantity pairs* submitted by the *market participant*.

Unlike the up to 20 *price-quantity pairs* that *market participants* submit in their *energy offers*, for speed no-load offers and start-up offers, *market participants* will submit a single value for each hour up to a maximum of 24 values<sup>9</sup>. For start-up offers, *market participants* may also submit a set of

<sup>9</sup> Refer to Offers, Bids and Data Inputs detailed design document for more information on start-up offers and speed no-load offers.

offers per thermal state. Therefore, for start-up offers, the *IESO* will determine a single reference level for each hour per thermal state.

The *IESO* will set reference levels for domestic suppliers of *energy* and *operating reserve* and may establish reference levels for an *energy* consumer if that consumer can benefit from higher *market prices*.

The *IESO* will establish start-up and speed no-load reference levels for resources for which *market participants* are eligible to submit start-up offers and speed no-load offers.

For an *operating reserve offer*, the *IESO* will establish an *operating reserve offer* reference level curve for each *operating reserve offer* block. This will include up to 5 non-decreasing values of the *operating reserve* reference level to form a monotonically increasing cost curve. This *operating reserve* reference level curve will be used for the conduct and impact testing of the *price quantity pairs* submitted by the *market participant*.

### 3.13.1.1 Process for Determining Cost-Based Reference Levels for Financial Dispatch Data Parameters

The *IESO* will develop cost-based reference levels in consultation with each *market participant* based on an estimate of the short-run marginal costs for each resource. This sub-section provides an overview of the process that the *IESO* will use to determine the reference levels for financial *dispatch data* parameters.

#### Initial Consultation and Frequency of Reference Level Review

The *IESO* will determine cost-based reference levels for financial *dispatch data* parameters in consultation with each *market participant* using the following process:

1. The *IESO* will provide participants with a detailed outline of costs that may be included in each category of financial reference levels.
2. *Market participants* will submit documentation to the *IESO* outlining their costs and other supporting information. Such supporting documentation may include a cost collection workbook that *market participants* complete, and acceptable materials to explain the values in the workbook.
3. The *IESO* will assess all submitted information for cost eligibility and appropriateness and review any other information it acquires and deems relevant.

After initial consultations, the *IESO*-determined reference levels will remain in effect unless:

- the *IESO* subsequently makes changes to the cost-based reference level methodology that warrants a revision of the initially determined reference levels; or
- the *IESO* or the *market participant* identifies a need for a cost data audit or review for completeness and accuracy and a consultation is initiated between the *market participant* and the *IESO* to revise reference level values; or
- the *market participant* notifies the *IESO* of an increase or a decrease in its initially submitted costs. *Market participants* shall inform the *IESO* if their initially submitted short-run marginal costs – excluding fuel and opportunity costs – decrease no later than five *business days* following the decrease in costs coming into effect.

The *IESO* may perform a periodic review of all, or a subset, of the cost data to verify its completeness and accuracy. This may result in the need to re-verify or revise previously approved cost data. If the consultations with the *market participant* result in a change in the reference level, the revised values will be used in an ongoing basis.

Any change to a reference level will not be accompanied with any retroactive *settlement* charges or credits due to the prior reference level value.

The process for updating reference level values that only concern a subset of values for an entire *trading day* or a portion of the *trading day* is covered in the relevant sub-section in Section 3.13.1.1.

### **Processing and Maintaining Reference Levels**

After the *IESO* and *market participants* complete the initial consultation for reference levels for financial *dispatch data*, the reference level will be registered in the form of equations through the Facility Registration process. Each reference level is described by an equation that identifies the relevant variables and coefficients. The variables in the equation are the relevant cost components approved by the *IESO*.

On a daily basis, the *IESO* will populate the values for each of the variables in each equation and the reference level values will be determined for a particular dispatch day for every applicable resource. The data that the *IESO* will use to populate values for each variable will depend on the variable. For example, natural gas prices would be used to populate values for *energy* reference levels for gas-fired resources.

These reference level values will then be used by the calculation engines for the day-ahead market, the pre-dispatch scheduling process and the *real-time market*.

### **Default Value for Operating Reserve Reference Levels**

If a resource has not established an *operating reserve* reference level, the *IESO* will use a default reference level of \$0.10/MW.

### **Market Participant Access to their Reference Levels**

For each *market participant*, the *IESO* will make the relevant reference levels available on a confidential basis. For more information on the reporting details related to market power mitigation refer to the Publishing and Reporting Market Information detailed design document.

### **Ongoing Updates to Reference Levels**

Certain cost components of the reference levels that are initially determined by the *IESO* in consultation with *market participants* will be updated daily. These components include fuel costs for natural gas, oil, diesel, biofuel and other similar resources and opportunity costs for hydroelectric and storage resources.

The *IESO* will establish a process in collaboration with *market participants* to determine fuel costs for relevant resources. The *IESO* will also establish a process in collaboration with *market participants* to determine opportunity costs for relevant resources.

These processes are intended to enable the *IESO* to perform ongoing updates and avoid the necessity of the *market participant* submitting new data each day.

### **Opportunity to Update Fuel Costs Prior to Market Scheduling**

Events that occur within the 24-hour period prior to the *trading day* can increase a *market participant's* expected fuel cost for a resource for one or several hours of the *trading day*. If *market participants* believe that their *IESO*-predetermined reference levels do not reflect their actual short-run marginal costs for one or more hours of a specific trading day, they may request the *IESO* to revise their reference levels prior to market scheduling.

In such cases, subject to other rules and restrictions about *offer* and cost changes,<sup>10</sup> a *market participant* may submit an updated fuel cost to be used in calculating the reference levels for a given hour or hours of the *trading day*.

The *market participant* must notify the *IESO* if the expected price to procure fuel for the resource for a given hour or hours in a given *trading day* will be lower than that used by the *IESO* to calculate the relevant reference levels.

The *IESO* will establish a process to allow *market participants* to submit<sup>11</sup> change requests for fuel costs. *Market participants* will be able to submit requests up to 30 minutes before the close of the *offer* window for the DAM and the mandatory<sup>12</sup> window in the *real-time market*. All verifiable supporting information, including cost data, must be submitted to the *IESO* before the *IESO* can begin assessing the request.

If the *IESO* can verify and substantiate the request, the *IESO* will revise the fuel cost component of the relevant reference level. This change will be applicable for the entire *trading day* or for a portion of that *trading day*. If the *IESO* is not able to verify and substantiate the change request in time or does not approve the change request, the *IESO* will use the original reference level and notify the *market participant*.

### 3.13.1.2 Cost-Based Reference Levels Calculation

The *IESO* will design the financial reference levels to include the short-run marginal costs incurred in the production of *energy*.

The general equation for each reference level is presented below. Certain cost components of the equations may not apply for all resource types. Where appropriate, the non-applicable value will be equal to zero.

**Energy Reference Level** = [*Incremental Heat Rate* × (*Fuel Costs* + *Service Price Adder*) × *Performance Factor*] + *Emission Costs* + *Operation and Maintenance* + *Opportunity Costs* + *Gross Revenue Charge*

**Speed No Load Reference Level** = [*No Load Heat Consumption* × (*Fuel Costs* + *Service Price Adder*) × *Performance Factor*] + *Emission Costs* + *Operation and Maintenance*

**Start – up Reference Level** = [(*Fuel Costs* + *Service Price Adder*) × (*Start – up Fuel Volume* + *Start – up Fuel Volume* × *Compressor Fuel Volume Adder*) × *Performance Factor*] + *Emission Costs* + (*Electricity Consumption Quantity* × *Electricity Consumption Price*) + *Operation and Maintenance*

**Operating Reserve Reference Level** = *Opportunity Costs*

<sup>10</sup> The resubmission of initial *dispatch data* into the pre-dispatch and real-time calculation engines are subject to restrictions for resources that receive DAM schedules. See the detailed design documents for Grid and Market Operations Integration and Offers, Bids and Data Inputs for additional information.

<sup>11</sup> This will apply in alignment to the DAM and *real-time market offer* submission rules. For example, speed no-load offers will be used as inputs to both the DAM and PD calculation engines, but it will not be used as an input to the RT calculation engine. For more information, refer to the Offers, Bids and Data Inputs detailed design document.

<sup>12</sup> If a *market participant* wishes to revise their submitted DAM *dispatch data* for the *real-time market*, then the *market participant* must submit the data no later than two hours prior to the *dispatch hour*, which is the mandatory window.

The *IESO* will develop further details and methodologies for each of the cost components in these equations for reference levels.

### Dual-Fuel Resource Treatment

Resources that have the capability to use two types of fuel to generate electricity and can opt to select either of the fuel types at any given time.

For dual-fuel resources that have provided their primary and secondary fuel types during the Facility Registration process, the *IESO* will establish two or more sets of reference levels – one for each fuel type selected for the resource by the *market participant* during the registration process.

The *IESO* will use a cost-based reference level methodology for thermal resources to establish financial reference levels for dual-fuel resources.

The *IESO* will use the least expensive fuel type among the registered primary and secondary fuel types for a resource's reference level for the timeframe when it tests a submitted *offer* for market power. *Market participants* can request the *IESO* to change this default fuel type selection if the least expensive fuel (in \$/MWh), as flagged by the *market participant* and approved by the *IESO*, is unavailable or not preferred because of an acceptable reason for the specific subset of hours during the *trading day*.

The following reasons will be considered acceptable for a *market participant* to request the *IESO* to use a reference level based on a more expensive fuel type:

1. The least expensive fuel type is not available.
2. There are opportunity costs considerations. For example, a *market participant* with limited oil stocks may choose to burn natural gas for a specific resource in the current period even though it would be less expensive to use oil. The *market participant* might want to use the more expensive fuel type in order to preserve their limited oil stocks for use in future hours in which gas would be much more expensive than the current period or might not be available at any price.
3. Certain binding emission limits or considerations exist. For example, a *market participant* may be subject to rolling emission limits that make it necessary for the *market participant* to burn gas in the current period, even though it would be less expensive to burn oil.
4. A particular fuel type needs to be used for start-up. For example, some resources have the capability to burn either oil or gas to generate electricity but can only start on gas either due to emission-related permit conditions or due to equipment constraints.
5. A resource needs to be operated in the dual-fuel mode using both types of fuels simultaneously.

In addition, there may be situations when an unforeseen event occurring within the 24-hour period prior to the *trading day* might impact the short-run marginal costs of a specific resource for an hour or several hours of the *trading day* prior to market scheduling. If *market participants* believe that the resource's reference levels for the least expensive fuel type will not reflect their actual short-run marginal costs for those hours, they may request the *IESO* to revise their reference levels values before market scheduling even though the less expensive fuel might not be available. Refer to the Opportunity to Update Certain Costs Prior to Market Scheduling sub-section in Section 3.13.1.1 for further details.



### **Process for Requesting a Reference Level Based on a More Expensive Fuel Type**

*Market participants* can submit a request to use a more expensive fuel type if they believe that their situation comes under one of the acceptable reasons 1-5 listed earlier in this section. When a *market participant* wishes to use a more expensive fuel type, the *market participant* will be allowed to request that the *IESO* use a reference level based on the more expensive fuel type for the purpose of market power mitigation. The *IESO* will develop a procedure for *market participants* to follow in order to submit the additional documentation required to support the request to use the reference level for a more expensive fuel type or source. *Market participants* will also be required to provide documentation to prove the use of a more expensive fuel type and source. The *IESO* will review all submitted information to assess eligibility.

*Market participants* can submit requests to the *IESO* to use a more expensive fuel type in two different timeframes: prior to the day-ahead market and prior to the close of the mandatory offer window in the *real-time market*. The procedure that *market participants* will be required to follow will vary depending on the timeframe for which the *market participants* request the different reference level.

#### **Submitting Requests Prior to the Day-Ahead Market**

If *market participants* want to submit requests prior to the day-ahead market, they must submit the requests at least 30 minutes before the close of the *offer* window for the day-ahead market.

When submitting the request, the *market participant* must provide the following information:

- All supporting cost data and other verifiable supporting information to the *IESO* before the *IESO* can begin its assessment of the request; and
- Specifically, the *market participant* must provide the *IESO* written verification to support the acceptable reason for using the higher-cost fuel.

Unless the *IESO* reviews the supporting information and approves the request, the *IESO* will use the reference level for the less expensive fuel type

#### **Submitting Requests Prior to the Close of the Mandatory Offer Window**

In the pre-dispatch timeframe, all requests must be submitted prior to the close of the mandatory *offer* window. For more information on the mandatory *offer* window, refer to the Grid and Market Operations Integration detailed design document. The process that will be used for requests in the pre-dispatch timeframe will be the same process as used prior to the day-ahead market.

NQS resources should submit requests for use of the higher-cost fuel before being committed by the *pre-dispatch scheduling* process. Once a resource is committed by the *pre-dispatch scheduling* process, then the following eligibility guidelines will apply for requests for using the higher-cost fuel:

- If the events which necessitated the request for use of the higher-cost fuel occurred prior to the commitment, then any request submitted following the commitment will be denied. This request should have been submitted before the commitment of the resource; and
- If the events which necessitated use of the higher-cost fuel occurred after the issuance of the commitment, then the request is eligible for approval. The need for the request would not have been known before the commitment of the resource.

The *market participant* will be required to provide an acceptable reason and supporting information for the use of the higher cost fuel in order for the *IESO* to use the higher-cost reference level.

A *market participant* for a resource might expect the lower cost fuel to be available and be scheduled based on the lower-cost fuel in the DAM. Following the DAM, the lower-cost fuel could become

unavailable. In these cases, the *market participant* for that resource will decide whether to use the higher-cost fuel to meet the resource's day-ahead schedule. If the *IESO* does not require the resource to switch to its alternate fuel for *reliability*, the *market participant* will be expected to manage their cost of meeting the resource's existing commitment from the day-ahead market.

A request for the *IESO* to use a more expensive reference level must be made by the *market participant* prior to the close of the mandatory offer window. Any submissions to change fuel type in real time during and after the close of mandatory window will be rejected. The *IESO* will use the last approved set of reference levels available for scheduling in real time.

### Settlement Process for Mitigating Dual Fuel Resources

After the *market participant* places a request to use the higher-cost fuel in either of the timeframes, they must provide evidence to the *IESO* that the higher-cost fuel was used. This evidence must be provided within two *business days* after the *trading day* in which the higher-cost fuel was used. If the *market participant* fails to provide supporting information demonstrating the use of the higher-cost fuel within the specified time or if the *IESO* does not find the provided evidence satisfactory, then the *IESO* will take the following steps:

1. The *IESO* will repeat the conduct test in the settlement timeframe using the lower reference level.
2. If this conduct test in the settlement timeframe using the lower reference level passes, then no further steps in this process are necessary.
3. If for any MWhs tested, the conduct test is failed using the lower reference level, then two further tests will be carried out for those MWhs:
  - The *IESO* will determine if the make-whole payment impact test would have been failed had the lower reference level been used in place of the higher reference level. If this is the case, then the *IESO* will adjust the make-whole payment for the MWhs that failed the conduct test so that it is equal to what would have been paid based on the lower reference level.
  - For each MWh that failed the conduct test in the settlement timeframe,<sup>13</sup> if the higher reference level is greater than or equal to the LMP at the resource and the LMP at the resource is also greater than or equal to the lower reference level, then the *IESO* will apply a *settlement charge*<sup>14</sup> in the amount of:

#### Reference Level Settlement Charge

$$= (\text{MWh that failed the conduct test}) * (\text{LMP} - \text{Lower Reference Level}) \\ * P \text{ Multiplier}$$

Where:

- The LMP is the resource's LMP from the day-ahead market or the *real-time market*;
- The P Multiplier is a persistence multiplier discussed in Section 3.9.2;

<sup>13</sup> Independent of the make-whole payment impact test from the bullet above.

<sup>14</sup> For calculation and *settlement process* details, refer to the Reference Level Settlement Charge section (3.13) in the Market Settlement detailed design document.

- For MWhs that are scheduled in the day-ahead market, the relevant LMP is the DA LMP; and
- For MWhs that are scheduled in the real-time market but not in the day-ahead market, the relevant LMP is the RT LMP.

### Treatment of Multiple Generation Facilities Modeled as a Single Resource

For dispatchable *generation facilities* modeled as a single resource that have multiple turbines and which can use two fuels, such as combined-cycle resources with both gas and steam turbines or *co-generation facilities*, the *IESO* will develop specific reference levels as described below:

- For combined-cycle resources, the *IESO* will define two sets of reference levels – one for the simple-cycle mode and one for the combined-cycle mode; and
- For *co-generation facilities*, the *IESO* will define a single set of reference levels.

For the resource types listed above, the *IESO* will develop a resource-specific methodology for calculating the fuel cost component of the reference levels.

### Pseudo Resource Treatment

In the *IESO-administered markets*, combined-cycle resources have the option to participate as *pseudo units*. All combined-cycle resources have the option to operate in simple-cycle mode and combined-cycle mode, either as *pseudo units* or as physical units.

Using the cost-based reference level methodology, the *IESO* will establish multiple sets of reference levels for all combined-cycle resources as follows:

- For simple-cycle mode:
  - *Pseudo unit* configuration reference level (only one configuration possible); and
  - Physical unit reference levels.
- For combined-cycle mode:
  - *Pseudo unit* reference levels for all possible configurations as relevant to a given resource such as running one combustion turbine with the steam turbine (1x1), running two combustion turbines with the steam turbine (2x1), etc.; and
  - Physical unit reference levels.

If more than one *pseudo unit* of a given combined-cycle resource is committed, the *IESO* will use a reference level that corresponds to the number of committed *pseudo units*, such as 1x1, 2x1, etc., where the costs would accurately reflect the split of the steam turbine start-up costs between all of the *pseudo units*. If the commitment changes and the *IESO* uses the reference level corresponding to a 2x1 unit for a resource even though the resource actually was committed to using a 1x1 unit for generation, the *market participant* can apply for cost recovery using the ex-post cost recovery process as described in Section 3.13.

The *IESO* will align its process of calculating reference levels for *pseudo units* and physical units with the translation approach of the relationship between physical and *pseudo units* that is currently used for modelling purposes.

### Average Cost Resource Treatment

This section applies to NQS resources that are not eligible for the day-ahead or real-time generator offer guarantee. For more information on these guarantee payments, refer to the Market Settlement detailed design document.

For these resources, the *IESO* will establish reference levels for *energy* and *operating reserve* price mitigation that are based on average costs. These will be used by the ex-ante mitigation framework in each timeframe. Like marginal cost reference levels, average cost levels will be resource-specific and determined in consultation with the *market participant*.

For the purpose of make-whole payment mitigation, the reference levels will be based on average costs only for the hours when the resource is online due to a manual constraint. Reference levels for these resources will be based on marginal costs for the hours following the manual constraint. To facilitate this, the *IESO* will create two sets of reference levels – one set based on average costs and one set based on marginal costs.

As part of this process, the *IESO* will determine the number of hours to amortize start-up costs over for each resource in consultation with the relevant *market participant*.

### Late Day Start Offers Treatment

NQS resources in the Ontario market submit start-up costs on an hourly basis. This allows them to submit higher start-up costs if they cannot run for their entire *minimum generation block run time* (MGBRT) within the period being scheduled. Such costs become higher towards the end of the day as *market participants* shift their *energy* and speed no-load costs for the next-day operation into their start-up costs. *Market participants* are allowed to do so to help ensure that the resource is economical even when the *IESO* only evaluates the remaining hours in the day. This scenario currently occurs in the DACP scheduling process but does not occur within the *pre-dispatch scheduling* process due to the design of the current real-time generator cost guarantee (RT-GCG) program. Following the implementation of the MRP, this scenario will occur in both the DAM and PD scheduling processes.

The *IESO* will use the cost-based methodology to determine reference levels for start-up offers. The *IESO* will include *minimum loading point energy* and speed no-load costs into the start-up reference levels for every hour that extends into the next day after HE 24.

The *IESO* will calculate the escalating start-up reference levels based on the reference levels for start-up offers, *energy*, and speed no-load offers. For a given hour, a reference level would equal the product of the number of hours of a resource's MGBRT (N), which would occur in the next day after HE 24, times the total incremental *energy* costs and speed no-load costs for MLP plus the total start-up costs for the resource's entire MGBRT period.

$$\text{Start – up Reference Level} = N \times (IE \times MLP + SNL) + SUC$$

Where:

N is the number of hours of a resource's MGBRT that spills into the next day, i.e.,  $N = \max(0, \text{MGBRT} - (24 - [\text{HE } x-1]))$ , where x (Hour Ending or HE) is the start hour MGBRT period;

IE is the incremental *energy* costs per MWh for MLP (costs to produce at MLP);

SNL is the speed no-load costs per hour for MLP (costs to produce at MLP);

SUC is the total start-up costs required during the resource's MGBRT (lump sum); and

MLP is the MW of a resource's *minimum loading point*.

### 3.13.2 Reference Level Methodology for Non-Financial Dispatch Data

The *IESO* will establish reference levels for non-financial *dispatch data* parameters. These parameters are described in the Facility Registration detailed design document. During the Facility Registration process, *market participants* will submit data and supporting documentation to the *IESO* to establish registered values and reference levels for non-financial *dispatch data* parameters. In general, a resource's registered values reflect its operational capabilities and are used to validate that a parameter was not offered in error, such as ensuring that certain *dispatch data* parameters are not negative values.

Non-financial *dispatch data* are tested for mitigation by using a validation process as described in section 3.5.

The *IESO* will determine the reference levels for non-financial *dispatch data* parameters using information provided by the *market participants* during the Facility Registration process. For more detailed information on the registration parameters submitted by *market participants*, refer to the Facility Registration detailed design document.

In the event that a *market participant* makes changes to a resource that impacts the operational characteristics described by a non-financial reference level, the *market participant* must update the registered value of the relevant non-financial reference level no later than five *business days* following such a change.

A resource's non-financial reference levels represent an assessment of how the resource is reasonably capable of operating in a competitive environment rather than an operational limit.

The reference level values for non-financial *dispatch data* parameters will be determined, where applicable:

- by season (summer and winter); and
- for on-peak and off-peak hours.

The summer period will be from May 1<sup>st</sup> to October 31<sup>st</sup> and the winter period will span from November 1<sup>st</sup> to April 30<sup>th</sup> of the following year. The *IESO* may initiate a consultation with a *market participant* to review and potentially reassess the non-financial *dispatch data* reference level values.

The *IESO* will develop guidelines for *market participants* to follow for registration of reference levels for non-financial *dispatch data* parameters, including the supporting documentation that will be accepted to support the verification process.

The *IESO* will provide *market participants* the ability to register different values for given non-financial parameter reference levels (e.g. for different seasons, on-peak and off-peak hours). However, values of a particular non-financial parameter that do not vary across these dimensions should be identical.

#### 3.13.2.1 Market Participant Access to their Reference Levels for Non-Financial Dispatch Data Parameters

The *IESO* will make available to each *market participant* their reference levels for non-financial *dispatch data* parameters.

## 3.14 Reference Quantities

### 3.14.1 Reference Quantity Methodology

The *IESO* will determine the reference quantities for *energy* and *operating* process. These pre-established reference quantities may be established as equations where appropriate and will be used in the ex-post analysis of physical withholding based on the operational capability of each specific resource.

The methodology that the *IESO* will use to determine the reference quantity for *energy* will be consistent with that used in Section 4 of the Reliability Outlook Methodology to assess resource contributions to *reliability*.<sup>15</sup>

The reference quantity for suppliers of *operating reserve* will be based on the operational capability of the resource. Operational restrictions that prevent a supplier of *operating reserve* from providing incremental *energy* can be reflected in their reference quantity.

If the approach described above does not fully account for the specific operational characteristics of a resource, *market participants* may submit additional data and supporting documentation to the *IESO* during the Facility Registration process. The *IESO* will review and use this additional information where appropriate to establish the reference quantity of each resource.

### 3.14.2 Initial Consultation and Frequency of Reference Quantity Review

The *IESO* will use the following process to determine the reference quantities for *energy* and *operating reserve* in consultation with *market participants*:

1. For *energy*, the *IESO* will provide participants with details of the methodology used in the Reliability Outlook Methodology to determine resource contributions to *reliability*.
2. For *operating reserve*, the *IESO* will provide participants with a technology-specific methodology for determining the reference quantity.
3. If these approaches do not fully account for the specific operational characteristics of a resource, *market participants* will submit a request for an alternate methodology to be applied. This request will be accompanied with documentation and other supporting information that substantiates the appropriateness of this alternate methodology.
4. The *IESO* will assess all submitted information for appropriateness and review any other information it acquires and deems relevant.
5. The *IESO* will determine an alternate approach to be warranted if it is more accurate in estimating a resource's operational capability.

After initial consultations, the *IESO*-determined reference quantities for *energy* or *operating reserve* will remain in effect unless:

- the *IESO* subsequently makes changes to the methodology used in the Reliability Outlook Methodology to determine resource contributions to *reliability* that warrants a revision of the initially determined reference quantities for *energy*; or
- the *IESO* makes changes to the technology-specific methodology for determining *operating reserve* reference quantity that warrants a revision of the initially determined reference quantities; or

<sup>15</sup> For more information on this methodology, see the *IESO* document Methodology to Perform the Reliability Outlook in the *IESO* website.

- the *market participant* identifies a need for a review for completeness and accuracy and a consultation is initiated between the *market participant* and the *IESO* to revise *energy* or *operating reserve* reference quantities; or
- the *market participant* notifies the *IESO* of a change in the operational capability of a particular resource. They must inform the *IESO* no later than five *business days* following the change coming into effect.

### 3.14.3 Ongoing Consultation with Market Participants on Reference Quantity

If a resource fails the initial conduct and impact tests for physical withholding and a *settlement* charge is to be applied, the *IESO* will first notify the *market participant* of the indicative finding. The *IESO* will allow *market participants* 15 *business days* to provide relevant supplementary information regarding the reference quantity for the resource.

Relevant supplementary information could include information regarding factors such as ambient temperature, humidity, water flow conditions and other resource specific considerations that are not accounted for in the registered *energy* or *operating reserve* reference quantity.

If the information provided by the *market participant* changes the *energy* or *operating reserve* reference quantity that the *IESO* had used in the initial conduct and impact tests, the *IESO* will re-run the conduct and impact tests. If the re-run still results in a failure of the conduct and impact tests, that revised finding will be used to determine the final *settlement* charge.

### 3.14.4 Market Participant Access to their Reference Quantities

The *IESO* will make available to each *market participant* their reference quantities for *energy* and *operating reserve*. For more information on the reporting details related to market power mitigation refer to the Publishing and Reporting Market Information detailed design document.

## 3.15 Settlement Cost Recovery Requests

As discussed in Section 3.13: Reference Levels, the *IESO* will set the cost-based reference levels for financial *offers* in advance of the day-ahead market *trading day*. The *IESO* will provide *market participants* with an opportunity to update certain cost values that will be used to set the reference level for a resource prior to running the DAM, PD and the RT calculation engines as described in Section 3.13.1.

There may be extenuating circumstances where the reference level for financial *offers* applied in the ex-ante mitigation process are considered to be inappropriate by the *market participant*. Such circumstances may include, but are not limited to, cases where:

- the *market participant* owning the resource requested a change to its reference level within a predefined period prior to market scheduling, but the *IESO* was unable to update the reference level in time; or
- the *market participant* owning the resource did not request a change to its reference level within a predefined period prior to market scheduling, but believes an incorrect reference level was used.

To address such circumstances, the *IESO* will implement an ex-post process to reconcile the reference level used for mitigation and the short-run marginal costs that the *market participant* considers, and the *IESO* agrees, are more appropriate. Only costs above the LMP up to the *offer* price that was current at the time that the relevant scheduling process was carried out will be eligible for this

process. These costs must be consistent with the short-run marginal costs defined in the reference level methodology as described in Section 3.13.

This ex-post process will be implemented as a part of the *IESO's* existing *Notice of Disagreement*<sup>16</sup> (NoD) process. *Market participants* will be able to submit a NoD when the reference level that was used as an input in the *settlement* process utilized a value for an eligible cost that was lower than ought to have been the case. These eligible costs are discussed in the Opportunity to Update Certain Costs Prior to Market Scheduling sub-section in Section 3.13.1.1.

### 3.15.1 Request Eligibility

A *market participant* will be able to submit an ex-post cost recovery request for a resource when:

- The *IESO* has applied market power mitigation to this resource for all or part of one or more *trading days*; and
- The *market participant* believes that the reference level for a financial parameter used during the mitigation process did not reflect the allowable short-run marginal costs the *market participant* incurred.

#### 3.15.1.1 Costs Allowed for Recovery

Provided that the *market participant* is eligible to submit a request, the *IESO* will determine whether to modify *settlement* as a result of adjusting certain cost components of the reference level. These eligible cost components are outlined in the Opportunity to Update Certain Costs Prior to Market Scheduling sub-section in Section 3.13.1.1.

In addition, only costs up to the *offer* price that was current at the time that the relevant scheduling process was carried out will be eligible for recovery.

### 3.15.2 Content of Request Submission

Eligible *market participants* will be able to submit the ex-post cost recovery request as part of a NoD request. They will need to include all the applicable documents as required by the NoD process, which includes completing the *notice of disagreement* form.

The *market participant* may be required to provide supporting documentation specific to the eligible reference level cost component in question. This documentation will be used to support the requested *settlement* change resulting from using a modified cost component of the reference level. This supporting documentation will be the same type of supporting documentation that is used for setting the reference levels.

## 3.16 Reporting on Mitigation

The *IESO* will create internal and external reports related to various processes and results involved in the mitigation framework. Reports that are internal to the *IESO*, not for public consumption will communicate information regarding the operation of the mitigation framework.

External reports will include:

- Confidential reports to *market participants* specific to each resource to identify their applicable reference levels;

<sup>16</sup> Section 1.3.5 of Market Manual 5.5 - Physical Markets Settlement Statements; Section 1.3.4 of Market Manual 5.7 - Financial Market Settlement Statements.



- Confidential reports to *market participants* specific to each resource to identify their applicable reference quantities;
- Confidential reports to *market participants* specific to each resource to notify them whether a request to modify the fuel cost used to determine reference levels was approved or denied;
- Confidential reports to *market participants* providing details of instances when *dispatch data* values at a resource were set to reference levels for economic withholding;
- Confidential reports to *market participants* of a failure of the conduct and impact tests for physical withholding;
- Confidential reports to *market participants* of a failure of the conduct and impact tests for economic withholding on an uncompetitive *intertie*;
- Public reports that contain summary data on an anonymous basis of how frequently the mitigation process resulted in *dispatch data* values being set to reference levels;
- Public reports that contain summary data on an anonymous basis of how frequently *settlement* charges were issued due to resources failing the conduct and impact tests for economic withholding;
- Public reports that contain summary data on an anonymous basis of how frequently *settlement* charges were issued due to resources failing the conduct and impact tests for physical withholding; and
- Public reports that contain summary data on an anonymous basis of how frequently *settlement* charges were issued due to resources failing the conduct and impact tests for economic withholding on an uncompetitive *intertie*.

For more information on reporting on market power mitigation, please see the Publishing and Reporting Market Information detailed design document.

– End of Section –

## 4 Market Rule Requirements

The *market rules* govern the *IESO-controlled grid* and establish and govern the *IESO-administered markets*. The *market rules* codify obligations, rights and authorities for both the *IESO* and *market participants*, and the conditions under which those rights and authorities may be exercised and those obligations met.

This section is intended to provide an inventory of the changes to *market rule* provisions required to support the Market Power Mitigation detailed design, and is intended to guide the development of *market rule* amendments. This inventory is based on version 1.0 of the detailed design, and any revisions required to this section as a result of design changes to version 1.0 will be incorporated in the *market rule amendment* process. As a result, the inventory will not be updated after its publication in version 1.0 of this detailed design.

This inventory is not meant to be an exhaustive list of required rule changes, but is a “snapshot” in time based on the current state of design development of this specific design document. Resulting *market rule amendments* will incorporate the integration of the individual design documents.

New and amended Chapter 11 defined terms: These terms will be consolidated in a single document at a later time as part of the *market rule amendment* process, and will support multiple design documents.

The inventory is developed in Table 4-1, which describes the impacts to the *market rules* and classifies them into the following three types:

- Existing – no change: Identifies those provisions of the existing *market rules* that are not impacted by the design requirements;
- Existing – requires amendment: Identifies those provisions of the existing *market rules* that will need to be amended to support the design requirements; and
- New – Identifies new *market rules* that will likely need to be added to support the design requirements.

**Table 4-1: Market Rule Impacts**

Market Rule Section [Chapter No.], [Section No.]	Type	Topic	Requirement
Chapter 7, Section 3.3.17	Existing - requires modification	IESO Authorities – Dispatch Data	Section 3.3.17: <ul style="list-style-type: none"> <li>• Existing cross reference to Appendix 7.6 – Local Market Power. This section on <i>IESO</i> authorities to direct submission or revision of <i>dispatch data</i> states that nothing in Sections 3.3.10 to 3.3.16 shall preclude the application of the provisions of Appendix 7.6 in respect of <i>dispatch data</i> that is revised or submitted in accordance with existing Sections 3.3.10 to 3.3.16.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>Either replace reference to Appendix 7.6 to new Appendix 7.8: Market Power Mitigation, which will replace existing 7.6 in its entirety, or delete cross-references if determined unnecessary.</li> </ul> OVERLAP: Offers, Bids and Data Inputs.
Chapter 7, Section 7.3.2	Existing - requires modification	Dispatch Instructions for Registered Facilities – Congestion Management Settlement Credits	Section 7.3.2: <ul style="list-style-type: none"> <li>Existing cross reference to Appendix 7.6 – Local Market Power. This section on the content of <i>dispatch instructions</i> for <i>registered facilities</i> that are not <i>boundary entities</i> cross references existing Appendix 7.6 – “subject to Appendix 7.6, be used in the <i>IESO settlement</i> process for determining any <i>settlement</i> amounts for congestion management pursuant to Section 3.5 of Chapter 9.”</li> <li>Either replace reference to Appendix 7.6 to new Appendix 7.8: Market Power Mitigation – which will replace existing Appendix 7.6 in its entirety, or delete cross-references if determined unnecessary.</li> </ul> OVERLAP: Offers, Bids and Data Inputs. References/amendments to congestion management <i>settlement</i> credits to be addressed in Market Settlement design document.
Chapter 9, Section 3.5.1	Existing - requires modification	Hourly Settlement Amounts for Congestion Management	Section 3.5.1: <ul style="list-style-type: none"> <li>Existing cross reference to Appendix 7.6 – Local Market Power – This section on congestion management <i>settlement</i> credits and <i>dispatch</i> deviations cross references existing Appendix 7.6 – “subject to Appendix 7.6 of Chapter 7,” when the <i>market participant</i> responds to the <i>IESO’s dispatch instructions</i>, receive as compensation a <i>settlement</i> credit equal to the change in implied operating profits resulting from such a response.</li> <li>Either replace reference to Appendix 7.6 to new Appendix 7.8: Market Power Mitigation – which will replace existing Appendix 7.6 in its entirety, or delete cross-references if determined unnecessary.</li> </ul> OVERLAP: References/amendments to congestion management <i>settlement</i> credits to be addressed in Market Settlement design document.

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
Chapter 9, Section 3.5.2	Existing - requires modification	Congestion Management Settlement Credits	Section 3.5.2: <ul style="list-style-type: none"> <li>Existing cross reference to Appendix 7.6 – Local Market Power – This section on congestion management <i>settlement</i> credits cross references existing Appendix 7.6 – “subject to Appendix 7.6 of Chapter 7, the hourly congestion management <i>settlement</i> credit for <i>market participant</i> ‘k’ for <i>settlement hour</i> ‘h’ (“CMSC<sub>k,h</sub>”) shall be determined by the following equation:”.</li> <li>Either replace reference to Appendix 7.6 to new Appendix 7.8: Market Power Mitigation – which will replace existing Appendix 7.6 in its entirety, or delete cross-references if determined unnecessary.</li> </ul> OVERLAP: References/amendments to congestion management <i>settlement</i> credits to be addressed in Market Settlement design document.
Chapter 9, Section 4.8.2	Existing - requires modification	Additional Non-Hourly Settlement Amounts	Sections 4.8.2, 4.8.2.2: <ul style="list-style-type: none"> <li>These sections specify that the <i>IESO</i> shall, at the end of each <i>energy market billing period</i>, distribute to <i>market participants</i>, on a pro-rata basis across all allocated quantities of <i>energy</i> withdrawn at all <i>RWMs</i> and <i>intertie metering points</i> during all <i>metering intervals</i> and <i>settlement hours</i> within that <i>energy market billing period</i>, any compensation received by the <i>IESO</i> as a result of a local market power investigation as set out in Sections 1.7.1 and 1.7.2 of Appendix 7.6. Update wording of section and cross references to reflect the new Market Power Mitigation process.</li> <li>Replace reference to Appendix 7.6 to new Appendix 7.8: Market Power Mitigation specific to the new sections in Appendix 7.8 related to after-the-fact <i>settlement</i> charges for physical withholding, uneconomic <i>interties</i>, and the dual fuel settlement charge, which may result in a distribution to <i>market participants</i>.</li> </ul> OVERLAP: Market Settlement design document.
Appendix 7.6	Existing - requires modification	Local Market Power	<ul style="list-style-type: none"> <li>Delete existing provisions in Appendix 7.6 - Local Market Power and replace with new market power mitigation construct in Appendix 7.8 NEW.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
Appendix 7.8, Section 1 NEW	New	Reference Levels	<p>Section 1 NEW – Reference Levels:                      Specify that the <i>IESO</i> shall, in consultation with <i>market participants</i>, determine reference levels where applicable and as further specified in the applicable <i>market manual</i>, for parameters of a <i>market participant’s dispatch data</i> as follows:  <u>Financial Reference Levels – Dispatch data Parameters:</u></p> <ul style="list-style-type: none"> <li>• <i>Energy offers</i> - The <i>IESO</i> shall establish an <i>energy offer</i> reference level curve for each set of <i>dispatch data</i> values, which will include up to 20 non-decreasing values of the <i>energy</i> reference level to form a monotonically increasing cost curve; codify formula for <i>energy</i> reference level.</li> <li>• <i>Speed no-load offers</i> - The <i>IESO</i> shall establish a single reference level for each hour per thermal state; codify formula for speed no load reference level.</li> <li>• <i>Start-up offers</i> - The <i>IESO</i> shall establish a single reference level for each hour per thermal state; codify formula for start-up reference level.</li> <li>• <i>Operating reserve offers</i> - The <i>IESO</i> shall establish an <i>operating reserve offer</i> reference level curve for each <i>operating reserve offer</i> block. This will include up to 5 non-decreasing values of the <i>operating reserve</i> reference level to form a monotonically increasing cost curve; codify formula for <i>operating reserve</i> reference level.</li> </ul>
Appendix 7.8, Section 1 NEW	New	Reference Levels	<p><u>Non-Financial Reference Levels – Dispatch data Parameters:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall determine the following non-financial reference levels by season (summer and winter); and for on-peak and off-peak <i>dispatch hours</i> where appropriate:                             <ul style="list-style-type: none"> <li>○ <i>Energy</i> ramp rate</li> <li>○ <i>Operating reserve</i> ramp rate</li> <li>○ Lead time</li> <li>○ <i>Minimum loading point</i></li> <li>○ <i>Minimum generation block run-time</i></li> <li>○ <i>Minimum generation block down time</i></li> <li>○ Maximum number of starts per day</li> <li>○ Ramp hours to <i>minimum loading point</i></li> <li>○ <i>Energy</i> per ramp hour.</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>• For the reference levels determined above, specify that the <i>IESO</i> shall:                             <ul style="list-style-type: none"> <li>○ Establish separate reference levels for financial reference levels (<i>energy</i>, speed no-load offers, start-up offers and <i>operating reserve</i>).</li> <li>○ Make available to each <i>market participant</i> the reference levels applicable to that <i>market participant's</i> financial <i>offers</i> and reference levels for non-financial <i>offers</i>.</li> <li>○ Keep the reference levels established by the <i>IESO</i> in effect until: (i) the <i>IESO</i> makes changes to the cost-based reference level methodology warranting a revision of the initially determined reference levels; (ii) the <i>IESO</i> identifies a need for a cost data review for completeness and accuracy; (iii) the <i>market participant</i> notifies the <i>IESO</i> of a decrease in its initially submitted costs; (iv) the <i>market participant</i> notifies the <i>IESO</i> of an increase in its initially submitted costs.</li> </ul> </li> <li>• Obligate <i>market participants</i>, as a condition of <i>facility</i> registration pursuant to new proposed Section 2.1.1.4 of Chapter 7, to provide to the <i>IESO</i> the documentation and data, as requested by the <i>IESO</i> to enable the <i>IESO</i> to determine reference levels.</li> <li>• Obligate <i>market participants</i> to submit <i>dispatch data</i> for non-financial <i>dispatch data</i> daily and hourly in the day-ahead market and <i>real-time market</i>.</li> <li>• Specify that the <i>IESO</i> may, at any time, perform a periodic review of all or a subset of the cost data submitted by <i>market participants</i> to verify its completeness and accuracy. Specify that the possible outcomes resulting from such a review will be either that the reference level remains unchanged, or that the reference level is updated to a revised value by the <i>IESO</i>, effective on a go-forward basis only.</li> <li>• Obligate <i>market participants</i> to inform the <i>IESO</i>, and update as applicable if:                             <ul style="list-style-type: none"> <li>○ financial reference levels: their initially submitted short-run marginal costs</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>decreased no later than five <i>business days</i> following such a change coming into effect.</p> <ul style="list-style-type: none"> <li>○ non-financial reference levels: their registered values have changed no later than five <i>business days</i> following such a change coming into effect.</li> <li>● Specify that <i>market participants</i> may request a consultation with the <i>IESO</i> to revise their reference level values if they believe that their <i>IESO</i>-determined reference levels do not reflect their actual short-run marginal costs. The <i>IESO</i> will determine if the request is material and appropriate before initiating a full review.</li> </ul>
Appendix 7.8, Section 1 NEW	New	Reference Levels	<p><u>Ongoing Updates to Reference Levels – Intra-Day Revisions:</u></p> <ul style="list-style-type: none"> <li>● Specify that <i>market participants</i> may request a temporary revision to the fuel cost component of a <i>facility’s</i> reference levels if:                             <ul style="list-style-type: none"> <li>○ They believe that the existing reference levels will not reflect short-run marginal costs for one or more hours of a specific trading day.</li> <li>○ The discrepancy between anticipated costs and reference level costs must be caused by an unforeseen event that occurs up to 24 hours prior to the <i>trading day</i>.</li> <li>○ Such request is submitted at least 30 minutes before the close of the <i>offer</i> window for the day-ahead market, and the mandatory window in the <i>real-time market</i>.</li> <li>○ The request is accompanied by supporting documentation at the time of the request.</li> </ul> </li> <li>● Obligate the <i>IESO</i>, for requests made in accordance with the conditions specified above to revise the fuel cost component for one or more hours of that <i>trading day</i>, if the <i>IESO</i> determines the request verifiable and substantiated. If the <i>IESO</i> is unable to verify and substantiate the change request in time or does not approve the change request, the <i>IESO</i> will use the original reference level. The <i>IESO</i> shall notify the <i>market participant</i> and inform them whether their request was approved or rejected.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
Appendix 7.8, Section 1 NEW	New	Reference Levels	<p><u>Dual-Fuel Treatment:</u></p> <ul style="list-style-type: none"> <li>• Specify that <i>market participants</i> with dual-fuel resources may request that the <i>IESO</i> use a reference level based on a more expensive fuel type in any one or more of the following circumstances:                             <ul style="list-style-type: none"> <li>○ The least expensive fuel type is unavailable.</li> <li>○ There are opportunity cost considerations.</li> <li>○ Certain binding emission limits or considerations exist.</li> <li>○ A particular fuel type needs to be used for start-up.</li> <li>○ A <i>facility</i> needs to be operated in the dual-fuel mode using both types of fuels simultaneously.</li> </ul> </li> <li>• Obligate <i>market participants</i> to submit to the <i>IESO</i> documentation to substantiate the need to use the higher reference level at the time of the request, in accordance with the following timelines:                             <ul style="list-style-type: none"> <li>○ for requests prior to the day-ahead market, requests must be submitted at least 30 minutes before the close of the <i>offer</i> window for the day-ahead market.</li> <li>○ In the pre-dispatch timeframe, all requests must be submitted prior to the close of the mandatory <i>offer</i> window.</li> </ul> </li> <li>• Obligate <i>market participants</i> to provide evidence that the higher cost fuel was used within two <i>business days</i> after the <i>trading day</i> in which the higher cost fuel was used. If the <i>market participant</i> fails to do so within the specified time, or if the <i>IESO</i> does not find the provided evidence satisfactory, the <i>IESO</i> shall:                             <ul style="list-style-type: none"> <li>○ repeat the conduct test ex-post using the lower reference level. If this after-the-fact conduct test using the lower reference level is passed, then no further steps in this process are necessary.</li> <li>○ if the after-the-fact conduct test is failed using the lower reference level, then the two further test will be carried out for the MWhs that failed this conduct test:                                     <ul style="list-style-type: none"> <li>▪ The <i>IESO</i> will determine if the MW payment impact test would have been failed, had the lower reference level been</li> </ul> </li> </ul> </li> </ul>



<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>used in place of the higher reference level. If this is the case, the <i>IESO</i> shall adjust the MW payment for the MWh that failed the conduct test so that it is equal to what would have been paid based on the lower reference level.</p> <ul style="list-style-type: none"> <li>▪ For each MWh that failed the after-the-fact conduct test, if the higher reference level is greater than or equal to the locational marginal price at the resource and the locational marginal price at the resource is also greater than or equal to the lower reference level, then the <i>IESO</i> shall apply a <i>settlement</i> adjustment – codify formula for reference level <i>settlement</i> charge including persistence multipliers.</li> </ul> <p>OVERLAP: Facility Registration, Grid and Market Operations Integration, Market Settlement, Day-Ahead, Pre-Dispatch and, Real-Time Calculation Engines.</p>
Appendix 7.8, Section 2 NEW	New	Designation of Uncompetitive Interties, NCAs, and DCAs	<p>Section 2 NEW – Designation of Uncompetitive Interties, NCAs, and DCAs:</p> <p><u>Designation of Uncompetitive Interties:</u></p> <ul style="list-style-type: none"> <li>• Allow the <i>IESO</i> to designate <i>interties</i> where competition is restricted as uncompetitive <i>interties</i> and apply mitigation measures at these uncompetitive <i>interties</i>.</li> <li>• An <i>intertie</i> will be designated as uncompetitive when any one of the following conditions are met:                             <ul style="list-style-type: none"> <li>○ An <i>intertie</i> where at least ninety percent of the day-ahead scheduled withdrawals or injections over that <i>intertie</i> in the ninety days prior to such an evaluation have been accounted for by one market control entity; or</li> <li>○ An <i>intertie</i> where the <i>IESO</i> finds grounds to believe that effective competition for the supply of imports or demand for exports is or is expected to be restricted.</li> </ul> </li> <li>• Obligate the <i>IESO</i> to <i>publish</i> which <i>interties</i> (if any) have been designated as uncompetitive <i>interties</i> on an ongoing basis and modify them as appropriate.</li> </ul>

Market Rule Section [Chapter No.], [Section No.]	Type	Topic	Requirement
Appendix 7.8, Section 2 NEW	New	Designation of Uncompetitive Interties, NCAs, and DCAs	<p><u>Designation of NCAs:</u></p> <ul style="list-style-type: none"> <li>• Obligate the <i>IESO</i> to <i>publish</i> NCA designations, along with each of the resources that are included within each NCA on an annual basis, and modify them as appropriate. Obligate the <i>IESO</i> to post this information no later than 30 days prior to the date that such designations come into effect.</li> <li>• Specify that the <i>IESO</i> may designate a load pocket as an NCA anytime the <i>IESO</i> expects that a load pocket will be constrained in more than 4% of the hours in the following year in either the day-ahead market or the <i>real-time market</i>.</li> </ul>
Appendix 7.8, Section 2 NEW	New	Designation of Uncompetitive Interties, NCAs, and DCAs	<p><u>Designation of DCAs:</u></p> <ul style="list-style-type: none"> <li>• Obligate the <i>IESO</i> to <i>publish</i> upcoming DCA designations, along with each of the resources that are included within each as quickly as reasonably possible. Obligate the <i>IESO</i> to indicate when the DCA designation will come into effect.</li> <li>• Obligate the <i>IESO</i> to determine the set of constrained areas of the transmission grid that meet any of the following conditions and may designate these as DCAs if: <ul style="list-style-type: none"> <li>○ The load pocket is import constrained in more than 15% of hours in a continuous five-day period prior to the current period in either the day-ahead market or the <i>real-time market</i>; or</li> <li>○ The <i>IESO</i> identifies the prospective initiation of an <i>outage</i> or recurring conditions that previously caused a binding import constraint for at least 15% of hours in a continuous 5-day period in either day-ahead market or the <i>real-time market</i>.</li> </ul> </li> </ul> <p>OVERLAP: Facility Registration, Publishing and Reporting, Day-Ahead, Pre-Dispatch and Real-Time Calculation Engines.</p>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p>Section 3 NEW – Ex-Ante Mitigation:</p> <p><u>Validation of Non-Financial Dispatch Data:</u></p> <ul style="list-style-type: none"> <li>• Obligate the <i>IESO</i> to validate the non-financial <i>dispatch data</i> against reference levels for a resource at the time of <i>dispatch data</i> submission.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall evaluate whether the non-financial <i>dispatch data</i> exceeds the parameter reference level and a predefined conduct threshold. If the submitted non-financial <i>dispatch data</i> value of any one of the non-financial <i>dispatch data</i> is outside the acceptable range determined by the reference level and the conduct threshold, that non-financial <i>dispatch data</i> will be rejected.</li> <li>Codify thresholds for non-financial <i>dispatch data</i>.</li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p><u>Economic Withholding:</u></p> <ul style="list-style-type: none"> <li>Obligate the <i>IESO</i> to perform a conduct and impact test, on financial and non-financial <i>dispatch data</i> submitted by a <i>registered market participant</i> for a <i>generation facility, dispatchable load facility, or storage facility for energy and operating reserve</i> as applicable, when one or more of the following conditions exist:                             <p><u>Ex-Ante Mitigation for Energy Price Impact:</u></p> <ol style="list-style-type: none"> <li><u>BCA Constraints:</u> <ul style="list-style-type: none"> <li>Specify the BCA exists when:                                     <ul style="list-style-type: none"> <li>one or more resources outside an NCA or a DCA are scheduled with a congestion component greater than \$25/MWh.</li> </ul> </li> </ul> </li> <li><u>Local Market Power Mitigation for Price Impact in NCAs and DCAs:</u> <p><u>Conditions:</u></p> <ul style="list-style-type: none"> <li>Specify that the condition for testing for local market power in an NCA or a DCA will be met when at least one of the transmission constraints that define an NCA or a DCA are binding in the as-offered scheduling pass of the relevant calculation engine.</li> </ul> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>Specify that when at least one of the transmission constraints that define a particular NCA or DCA is binding, the <i>IESO</i> shall test all resources that have submitted <i>offers</i> and are a part of the identified area.</li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>Specify that when at least one of the transmission constraints that define any NCA or DCA is binding, the <i>IESO</i> shall</li> </ul> </li> </ol> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>apply a conduct test to all resources that are a part of that NCA or DCA. The conduct test will identify all resources with <i>energy offers</i>, start-up offers, or speed no-load offers that violate the relevant conduct test thresholds. Codify the NCA and DCA conduct thresholds.</p> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that resources that are being tested for local market power for an NCA or a DCA and that have <i>offered</i> outside their conduct thresholds will be subject to the impact test. For these resources, all <i>dispatch data</i> parameters that violated the conduct test will be set to their respective reference level for the purpose of determining price impacts. Codify NCA and DCA impact thresholds.</li> <li>○ Specify that the price impact test is failed for a resource if there is a price impact at the resource that is greater than the corresponding NCA or DCA price impact threshold.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>○ Specify that if there is a price impact in excess of the impact threshold at any resource that is part of an NCA or a DCA, then the <i>dispatch data</i> parameters of all resources that are part of that NCA or DCA that violated the relevant conduct threshold will be substituted with the relevant reference levels to determine dispatch schedules and prices.</li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p>(3) <u>Local Market Power Mitigation for Price Impact in the BCA:</u></p> <p><u>Conditions:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the <i>IESO</i> shall test for local market power in the BCA when any resource that is not a part of an NCA or DCA is scheduled with a congestion component greater than \$25/MWh.</li> </ul> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>○ Specify that all resources within the BCA that have positive congestion components greater than \$25/MWh will be tested for price impact using the BCA conduct and impact thresholds.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the <i>IESO</i> shall apply a conduct test to all resources identified in the test above. The conduct test will identify all resources with <i>energy offers</i>, start-up offers, speed no-load offers that violate the relevant conduct test thresholds. Codify the BCA conduct thresholds.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that resources that are being tested for local market power in the BCA and that have <i>offered</i> outside their conduct thresholds will be subject to the impact test. For these resources, all <i>dispatch data</i> parameters that violated the conduct test will be set to their respective reference level for the purpose of determining price impacts. Codify the BCA impact thresholds.</li> <li>○ Specify that the price impact test is failed for a resource if there is a price impact at the resource that is greater than the corresponding BCA price impact threshold.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>○ For all resources in the BCA that failed the price impact test, the <i>IESO</i> will substitute the <i>dispatch data</i> parameters that were offered outside of their conduct thresholds with their respective reference levels to determine <i>dispatch</i> schedules and prices.</li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p>(4) <u>Global Market Power:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the <i>IESO</i> shall designate, evaluate and modify global market power reference <i>interties</i> in order to assess restrictions to global competition. Such <i>interties</i> will be limited to those that are directly connected to a wholesale electricity market.</li> </ul> <p><u>Conditions:</u></p> <ul style="list-style-type: none"> <li>○ Specify the following two conditions to determine if the potential for the exercise global market power exists:                             <ul style="list-style-type: none"> <li>○ Condition 1: a restricted ability to schedule incremental imports; and</li> <li>○ Condition 2: a price condition – if nodal prices at the global market power reference <i>interties</i> ignoring <i>intertie</i> congestion (i.e. the <i>intertie</i></li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>border price) are greater than the specified threshold value of \$100/MWh in the results of either the day-ahead market or the <i>pre-dispatch scheduling</i> process. Specify that the <i>IESO</i> may update the threshold value.</p> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the test for market power mitigation for global market power will be triggered when both condition 1 and 2 are met. The <i>market participants</i> tested will be limited to those with resources that can meet incremental load within Ontario.</li> <li>○ Specify that the <i>IESO</i> will have the ability to evaluate and modify the transmission constraints that are used to conduct the evaluation.</li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the <i>IESO</i> shall apply a conduct test to all resources that are not otherwise excluded on the basis of the tests discussed above. The conduct test will identify all resources with <i>energy offers</i>, start-up offers, and speed no-load offers that violate the relevant conduct test thresholds. Codify the global market power conduct thresholds.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that resources that are being tested for global market power and that have <i>offered</i> outside their conduct thresholds will be subject to the impact test. For these resources, all <i>dispatch data</i> parameters that violated the conduct test will be set to their respective reference level for the purpose of determining price impacts. Codify the global market power impact thresholds.</li> <li>○ Specify that the price impact test is failed for a resource if there is a price impact at the resource that is greater than the corresponding global - <i>energy</i> price impact threshold at all of the global market power reference <i>inerties</i>.</li> </ul> <p><u>Mitigation Timing and Application:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the <i>IESO</i> shall test for global market power in the day-ahead market and in each run of the <i>pre-dispatch scheduling</i> process.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>○ Specify that if the conditions for global market power are met for the hour ahead in the <i>pre-dispatch scheduling</i> process, then the resources that also failed the conduct and impact thresholds for this hour will continue to be tested for mitigation during the real-time scheduling process for that <i>dispatch hour</i>.</li> <li>○ Specify that if there is a price impact in excess of the global market power impact threshold at any resource tested, the <i>IESO</i> will substitute the <i>dispatch data</i> parameters that were offered outside of their conduct thresholds with their respective reference levels to determine <i>dispatch</i> schedules and prices.</li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p><u>Ex-Ante Mitigation for Operating Reserve Price Impact:</u></p> <p>(1) <u>Local Market Power:</u></p> <p><u>Conditions:</u></p> <ul style="list-style-type: none"> <li>○ The <i>IESO</i> has set the MIN area reserve constraint to a value greater than 0 for a reserve area.</li> </ul> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>○ Specify that when the conditions for local market power for a specific class of <i>operating reserve</i> are met, all resources offering <i>operating reserve</i> in the relevant reserve area will be tested.</li> <li>○ Specify resources within a region in which incremental <i>operating reserve</i> of a given class cannot be scheduled due to a MAX area reserve constraint will not be tested.</li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify the <i>IESO</i> shall carry out the conduct test for all resources eligible to be tested as noted above, and will assess whether any of the relevant parameters violates the conduct threshold for the relevant type of <i>operating reserve</i>. The conduct test will be applied for all <i>dispatch data</i> parameters, except for <i>operating reserve offers</i> lower than \$5/MW, and will assess if the <i>offered</i> value fails the conduct test.</li> </ul> <p><u>Impact Test:</u></p>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>○ Specify that the price impact test for <i>operating reserve</i> for local market power will compare <i>operating reserve</i> prices for the relevant class of <i>operating reserve</i> from the as-offered pricing pass of the calculation engine to the reference level pricing pass of the relevant calculation engine.</li> <li>○ If the <i>operating reserve</i> price in the as-offered pricing pass for a tested resource exceeds the relevant <i>operating reserve</i> price in the reference level pricing pass by more than the impact threshold, the resource will fail the impact test. Codify the impact thresholds for local market power for <i>operating reserve</i>.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>○ Specify that when the price impact test is failed for <i>operating reserve</i> for a particular reserve area, the <i>IESO</i> shall:                             <ul style="list-style-type: none"> <li>○ Determine the resources that were tested for local market power for <i>operating reserve</i> of that class and which failed the conduct test for that class; and</li> <li>○ For the identified resources, substitute the <i>dispatch data</i> parameters that were offered outside of their conduct thresholds with their respective reference levels to determine <i>dispatch</i> schedules and prices.</li> </ul> </li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p>(2) <u>Global Market Power:</u></p> <p><u>Conditions:</u></p> <ul style="list-style-type: none"> <li>○ The unmitigated market clearing price of a class of <i>operating reserve</i> exceeds a threshold level of \$15/MW.</li> </ul> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>○ Specify that when the conditions for global market power for a specific class of <i>operating reserve</i> are met, all resources offering that class of <i>operating reserve</i> will be tested except for resources that are in a reserve area with a binding MAX area reserve constraint.</li> <li>○ Specify resources within a region in which incremental <i>operating reserve</i> of a given</li> </ul>



<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>class cannot be scheduled due to a MAX area reserve constraint will not be tested.</p> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify the <i>IESO</i> shall carry out the conduct test for all resources eligible to be tested as noted above, and will assess whether any of the relevant parameters violates the conduct threshold for the relevant type of <i>operating reserve</i>. The conduct test will be applied for all <i>dispatch data</i> parameters, except for <i>operating reserve offers</i> less than \$5/MW, and will assess if the <i>offered</i> value is greater than the conduct threshold for the applicable <i>dispatch data</i> parameter.</li> <li>○ Codify the conduct thresholds for global market power test for <i>operating reserves</i>.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the price impact test for <i>operating reserve</i> for global market power will compare <i>operating reserve</i> prices for the relevant class of <i>operating reserve</i> from the as-offered pricing pass of the calculation engine to the reference level pricing pass of the relevant calculation engine.</li> <li>○ If the <i>operating reserve</i> price in the as-offered pricing pass for a tested resource exceeds the relevant <i>operating reserve</i> price in the reference level pricing pass by more than the impact threshold, the resource will fail the impact test. Codify the impact thresholds for global market power for <i>operating reserve</i>.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>○ Specify that when the price impact test is failed for <i>operating reserve</i> for a particular reserve area, the <i>IESO</i> shall:                         <ul style="list-style-type: none"> <li>○ Determine the resources that were tested for global market power for <i>operating reserve</i> of that class and which failed the conduct test for that class; and</li> <li>○ For the identified resources, substitute the <i>dispatch data</i> parameters that were offered outside of their conduct thresholds with their respective reference</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			levels to determine <i>dispatch</i> schedules and prices.
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p><u>Timing of Ex-Ante Mitigation Test for Price Impact:</u></p> <ul style="list-style-type: none"> <li>○ Specify that the conduct and impact test is carried out ex-ante in the day-ahead market, the pre-dispatch scheduling processes, and if processing time permits, the real-time <i>dispatch</i> scheduling process.</li> <li>○ Specify that for each hour of the DAM or PD look-ahead period for which any of the conditions for testing for mitigation are met, the relevant calculation engine will:                             <ul style="list-style-type: none"> <li>○ Test each resource that meets these conditions to determine if the applicable conduct and impact tests for price impact failed; and</li> <li>○ If one or more <i>dispatch data</i> values of the resource fails the conduct and the price impact tests, substitute the resource’s <i>offered</i> values for those <i>dispatch data</i> parameters with their reference levels to determine DAM or PD schedules and prices.</li> </ul> </li> </ul>
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p><u>Ex-Ante Commitment Cost Mitigation in the Day-Ahead Market and Pre-Dispatch Timeframes:</u></p> <ul style="list-style-type: none"> <li>○ Specify that if the conditions for testing for price impact are met in the DAM or PD look-ahead period, then commitment costs (which include start-up costs, speed no load costs and <i>energy</i> costs up to MLP) will be tested for all prior hours where the conditions are met. If conditions are met for more than one constrained area for the same resource, then the commitment costs will be tested using the most restrictive of the conduct thresholds.</li> <li>○ Specify that if the price impact test fails for any of the hours that met the relevant conditions for price impact testing, then the <i>IESO</i> will replace the commitment cost offers for all hours leading up to and including that hour with the appropriate reference level values.</li> <li>○ Specify that if a non-quick start resource was committed in the PD scheduling process (not in</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			the DAM), and had <i>dispatch data</i> parameters that were mitigated at the time of commitment, then those <i>dispatch data</i> parameters will continue to be mitigated in the RTD. These <i>dispatch data</i> parameters will not be reassessed by subsequent runs of the PD scheduling process.
Appendix 7.8, Section 3 NEW	New	Ex-Ante Mitigation	<p><u>Ex-Ante Mitigation in the Real-Time Timeframe:</u></p> <ul style="list-style-type: none"> <li>○ Specify that mitigation in real time may be applied based on conduct and impact testing within the RT calculation engine. If mitigation is instead applied in RTD based on an assessment by the PD calculation engine, then the decision to mitigate RTD will be made with hourly granularity for an entire <i>dispatch hour</i> based on the PD results.</li> <li>○ Specify that if a non-quick start resource was committed in the PD scheduling process instead of a DAM commitment, and had <i>dispatch data</i> parameters that were mitigated at the time of commitment, then those <i>dispatch data</i> parameters will continue to be mitigated in the RTD. These <i>dispatch data</i> parameters will not be reassessed by subsequent runs of the PD scheduling process.</li> </ul> <p>OVERLAP: Offers, Bids and Data Inputs, Grid and Market Operations Integration, Day-Ahead, Pre-Dispatch and Real-Time Calculation Engines.</p>
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<p>Section 4 NEW – Settlement - Automated Mitigation for Make-Whole Payment Impact:</p> <p><u>Mitigation of Make-Whole Payments:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall test market conditions for the exercise of local market power and global market power and apply a <i>settlement</i> mitigation process to test the relevant resources for make-whole payment impact.</li> </ul> <p><u>Local market Power for Make-Whole Payment Impact on NCAs and DCAs:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall carry out the conduct and impact tests for make-whole payment impact in an NCA or a DCA when any of the following conditions are met:</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>○ a resource met the conditions for ex-ante mitigation for price impact in an NCA or DCA where at least one transmission constraint that defines an NCA or DCA are binding; or</li> <li>○ An NQS resource was committed, which would otherwise receive a make-whole payment. This resource also has a positive congestion component greater than \$0/MWh on any binding constraint that is an NCA or DCA constraint; or</li> <li>○ An NQS resource was committed, which would otherwise receive a make-whole payment. This resource has a GSF greater than 0.02 on an active constraint that is an NCA or DCA constraint. This constraint would have been binding or would have been violated but for the commitment of the resource.</li> </ul> <p><u>Resources Tested:</u></p> <ul style="list-style-type: none"> <li>● Specify that the <i>IESO</i> shall test the following resources for make-whole payment impact:                             <ul style="list-style-type: none"> <li>○ all relevant resources inside that NCA or DCA that received make-whole payments are tested for local market power for make-whole payment impact in the corresponding NCA or DCA.</li> <li>○ any NQS resource committed inside a constrained area when the transmission constraints that define a particular constrained area would have been binding, absent the commitment of that NQS resource.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>● Specify that the <i>IESO</i> shall apply a conduct test to all resources identified in the resources tested discussed above. Codify NCA and DCA conduct thresholds for make-whole payments.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>● Specify that all resources that failed the conduct test for local market power for an NCA or a DCA will be subject to the impact test. Codify NCA and DCA impact thresholds that will be used for make-whole payments.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>● Specify that for any resource that fails the NCA or DCA impact test for make-whole payments, that the</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p><i>IESO</i> will recalculate the make-whole payment using the reference levels for those <i>dispatch data</i> values that were <i>offered</i> outside of the allowed conduct thresholds.</p>
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<p><u>Local Market Power for Make-Whole Payment Impact in the BCA:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall test for make-whole payment mitigation for the resource in the BCA when a resource meets any of the following conditions:                             <ul style="list-style-type: none"> <li>○ The resource met the conditions for ex-ante mitigation for price impact in the BCA; or</li> <li>○ An NQS resource was committed, which would otherwise receive a make-whole payment, and has a positive congestion component greater than \$0/MWh on any binding constraint that was not an NCA or DCA constraint; or</li> <li>○ An NQS resource was committed, which would otherwise receive a make-whole payment, and has a GSF greater than 0.02 on an active constraint that was not an NCA or DCA constraint and which would have been binding or been violated but for the commitment of the resource.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall apply a conduct test to all resources identified as being in the BCA. Codify BCA conduct thresholds for make-whole payments.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that resources that failed their conduct thresholds will be subject to the impact test. Codify BCA impact thresholds that will be used for make-whole payments.</li> <li>• Specify that when testing local market power for the BCA, a resource will fail the make-whole payment impact test if the make-whole payment calculated using the reference levels is greater than the make-whole payment calculated using the as-offered values by more than the BCA make-whole payment impact threshold.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>• Specify that for any resource that fails the impact test for make-whole payments, that the <i>IESO</i> will recalculate the make-whole payment using the reference levels for those <i>dispatch data</i> values that</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			were <i>offered</i> outside of the allowed conduct thresholds.
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<p><u>Local Market Power for Make-Whole Payment Impact due to Reliability Constraints:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall test for make-whole payment for a <i>reliability</i> constraint any time a resource is scheduled as a result of a <i>reliability</i> constraint.</li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall apply a conduct test to all resources identified above. Codify <i>reliability</i> constraint thresholds for make-whole payments.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>Specify that resources that are being tested for a <i>reliability</i> constraint that have <i>offered</i> outside their conduct thresholds will be subject to the impact test. Codify <i>reliability</i> constraint impact thresholds that will be used for make-whole payments.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>Specify that for any resource that fails the <i>reliability</i> constraint impact test for make-whole payments, that the <i>IESO</i> will recalculate the make-whole payment using the reference levels for those <i>dispatch data</i> values that were offered outside of the allowed conduct thresholds.</li> </ul>
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<p><u>Global Market Power for Make-Whole Payment Impact in the Energy Market:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall carry out the conduct and impact tests for make-whole payment impact for global market power when any of the following conditions are met:                             <ul style="list-style-type: none"> <li>Any resource that was tested for global market power for price impact but was not mitigated and would otherwise receive a make-whole payment; or</li> <li>Any NQS resource that was committed in the <i>pre-dispatch scheduling</i> process and is otherwise receiving an unmitigated make-whole payment for that commitment which exceeds \$10,000.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall apply a conduct test to all resources identified above. Codify the global</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			market power conduct thresholds for make-whole payments. <u>Impact Test:</u> <ul style="list-style-type: none"> <li>Specify that resources that are being tested for global market power that have <i>offered</i> outside their conduct thresholds will be subject to the impact test. Codify the global market power impact thresholds that will be used for make-whole payments.</li> </ul> <u>Mitigation Application:</u> <ul style="list-style-type: none"> <li>Specify that for any resource that fails the impact test for make-whole payments, that the <i>IESO</i> will recalculate the make-whole payment using the reference levels for those <i>dispatch data</i> values that were offered outside of the allowed conduct thresholds.</li> </ul>
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<u>Local Market Power for Make-Whole Payment Impact in the Operating Reserve Market:</u> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall carry out the conduct and impact tests for make-whole payment impact for local market power for <i>operating reserve</i>, for any resource that meets all of the following conditions:                             <ol style="list-style-type: none"> <li>The resource was tested for local market power for <i>operating reserve</i> price impact;</li> <li>The resource would otherwise receive a make-whole payment; and</li> <li>The resource is scheduled to provide <i>operating reserve</i>.</li> </ol> </li> </ul> <u>Conduct Test:</u> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall apply a conduct test to all resources identified above.</li> <li>Codify the local market power conduct thresholds for make-whole payments.</li> </ul> <u>Impact Test:</u> <ul style="list-style-type: none"> <li>Specify that of the resources that are being tested for local market power for <i>operating reserve</i>, a resource will fail the make-whole impact test if the make-whole payment calculated using the <i>dispatch data</i> used to set schedules and prices is greater than the one calculated using the reference level values by more than the applicable make-whole payment impact threshold. Codify the impact thresholds that will be used for make-whole payments.</li> </ul> <u>Mitigation Application:</u>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>Specify that, in order to mitigate the resources that failed the impact test, the <i>IESO</i> will calculate its make-whole payment using the reference levels for those <i>dispatch data</i> values that were <i>offered</i> outside of the allowed conduct thresholds.</li> </ul>
Appendix 7.8, Section 4 NEW	New	Settlement – Automated Mitigation for Make-Whole Payment Impact	<p><u>Global Market Power for Make-Whole Payment Impact in the Operating Reserve Market:</u></p> <ul style="list-style-type: none"> <li>Specify that any resource that meets either of the following conditions will be tested for ex-post mitigation for make-whole payments:                             <ul style="list-style-type: none"> <li>The resource was tested for global market power for <i>operating reserve</i> and is receiving a make-whole payment; or</li> <li>An NQS resource is committed and scheduled to provide <i>operating reserve</i>, and would otherwise receive an unmitigated make-whole payment for that commitment that exceeds \$10,000.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall apply a conduct test to all resources identified above.</li> <li>Codify the global market power for <i>operating reserve</i> conduct thresholds for make-whole payments.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>Specify that a resource that is being tested for global market power for <i>operating reserve</i>, will fail the make-whole impact test if the make-whole payment calculated using the <i>dispatch data</i> used to set schedules and prices is greater than the one calculated using the reference level values by more than the relevant make-whole payment impact threshold. Codify the impact thresholds that will be used for make-whole payments.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>Specify that for any resource that is tested for make-whole payment impact for global market power for <i>operating reserve</i> and fails the impact test, the <i>IESO</i> will calculate its make-whole payment using the reference levels for those <i>dispatch data</i> values that were <i>offered</i> outside of the allowed conduct thresholds.</li> </ul> <p>OVERLAP: Offers, Bids and Data Inputs, Grid and</p>



<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			Market Operations Integration, Market Settlement, DAM, PD, and RT Calculation Engines.
Appendix 7.8, Section 5 NEW	New	Ex-Post Mitigation	Section 5 NEW – Ex-Post Mitigation: <u>Physical Withholding: Ex-Post Market Simulation:</u> <ul style="list-style-type: none"> <li>• Allow the <i>IESO</i> to perform ex-post analysis of market impacts by running market simulations.</li> <li>• Allow the <i>IESO</i> to test if prices were materially impacted by <i>energy</i> or <i>operating reserve offers</i> of quantities significantly less than reference quantities.</li> <li>• Specify that physical withholding occurs when one or more <i>market participants</i> do not:                             <ul style="list-style-type: none"> <li>○ <i>Offer energy</i> or <i>operating reserve</i> that is otherwise available.</li> </ul> </li> </ul>
Appendix 7.8, Section 5 NEW	New	Ex-Post Mitigation	<u>Physical Withholding: Reference Quantities:</u> <ul style="list-style-type: none"> <li>• In order to carry out the Conduct and Impact test, obligate the <i>IESO</i> to determine reference quantities that are estimates of the quantity of <i>energy</i> or <i>operating reserve</i> that the <i>market participant</i> would have <i>offered</i> if competition had not been restricted.</li> <li>• Specify that the <i>IESO</i> will carry out the conduct and impact tests using the reference quantity.</li> <li>• Specify that, if any resource fails the initial conduct and impact test using the reference quantity, the <i>IESO</i> shall notify the <i>market participant</i> and allow them fifteen <i>business days</i> to provide relevant supplementary information regarding the reference quantity.</li> <li>• Specify that, if the information provided by the <i>market participant</i> changes the reference quantity used in the initial conduct and impact tests, the <i>IESO</i> shall re-run the conduct and impact tests.</li> <li>• If the re-run still results in a failure of the conduct and impact tests, that revised finding will be used to determine a <i>settlement</i> charge.</li> <li>• Specify that the <i>IESO</i> shall, in its assessment for physical withholding, carry out a conduct test on the basis of both the individual resource and of the relevant market control entity.</li> </ul> <u>Conditions - Energy:</u>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> shall consider the following resources to be eligible for testing for physical withholding:                             <ul style="list-style-type: none"> <li>○ Resources that have an LMP greater than \$25/MWh and installed capacity of at least 10 MW.</li> <li>○ Resources that have an LMP greater than \$25/MWh and the market control entity for each resource has at least 10 MW in aggregate installed capacity.</li> </ul>                             In order to be tested for physical withholding, the above mentioned resources must meet at least one of the following conditions:                             <ul style="list-style-type: none"> <li>○ the resource is located inside an NCA or a DCA where at least one of the transmission constraints that defines that NCA or the DCA is binding, including resources that did not submit any <i>offers</i>; or</li> <li>○ the resource has a positive congestion component greater than a threshold value of \$25/MWh, including resources that did not submit any offers; or</li> <li>○ the resource can meet incremental load within Ontario when the conditions for testing for global market power for <i>energy</i> price impact are met, including resources that did not submit any <i>offers</i>.</li> </ul> <u>Conduct Test:</u> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may apply a conduct test for all resources identified in the section above. If the <i>IESO</i> applies the conduct test, it will determine if the conduct test is failed on the basis of <i>energy offers</i>.</li> <li>• Codify the conduct thresholds for physical withholding.</li> </ul> <u>Impact Test:</u> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may perform the impact test for physical withholding on resources that meet all the conditions described above and fail any of the conduct test.</li> <li>• Codify the impact thresholds for physical withholding.</li> </ul> <u>Mitigation Application:</u> <ul style="list-style-type: none"> <li>• Specify that if a <i>market participant</i> fails the conduct and impact tests for physical withholding, that <i>market participant</i> will be subject to a <i>settlement</i> charge for each instance of physical withholding.</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>An instance of physical withholding is defined as a single <i>dispatch day</i> on which physical withholding is found to occur per market control entity.</p> <ul style="list-style-type: none"> <li>• Specify that the <i>settlement</i> charge will be made up of the base <i>settlement</i> charge adjusted by relevant multipliers.</li> <li>• The base <i>settlement</i> adjustment shall be calculated using the MWh quantity that failed the conduct and impact tests for physical withholding for a <i>dispatch day</i>:                         <ul style="list-style-type: none"> <li>○ In the day-ahead market, the MWs withheld for each hour of the <i>dispatch day</i> will be the total hourly quantity that failed the conduct and impact tests for physical withholding from the day-ahead market. The price that is used is the day-ahead LMP that occurred at the resource for each hour. The quantity that failed the conduct and impact tests in each hour will be multiplied by the corresponding hourly price to yield a <i>settlement</i> charge for the hour. The day-ahead base <i>settlement</i> charge for a <i>dispatch day</i> is the sum of <i>settlement</i> charges across all hours of the <i>dispatch day</i> for which the conduct and impact tests were failed.</li> <li>○ In the <i>real-time market</i>, the MWs of <i>energy</i> withheld for each interval of the <i>dispatch day</i> will be the total quantity per interval that failed the conduct and impact test for physical withholding from the <i>real-time market</i>. The price used is the real-time LMP that occurred at the resource for each interval. The quantity that failed the conduct and impact tests in each interval will be multiplied by the corresponding real-time price to yield a <i>settlement</i> charge for the interval. The real-time base <i>settlement</i> charge for a <i>dispatch day</i> is the sum of <i>settlement</i> charges across all intervals of the <i>dispatch day</i> for which the conduct and impact tests were failed.</li> <li>○ If a resource fails the conduct and impact tests for a <i>dispatch hour</i> in both the day-ahead market and <i>real-time market</i>, specify that the IESO will levy the higher of the two base</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p><i>settlement</i> charges. Codify formula for real-time and day-ahead market base <i>settlement</i> adjustment.</p> <p><u>Conditions – Operating Reserve:</u></p> <ul style="list-style-type: none"> <li>• Specify that the following conditions will result in a resource being eligible for testing for physical withholding in the <i>operating reserve</i> market:                             <ul style="list-style-type: none"> <li>○ Resources that have an LMP greater than \$5/MW and an installed capacity of at least 10 MW; or</li> <li>○ Resources that have an LMP greater than \$5/MW and the market control entity for each resource has at least 10 MW in aggregate installed capacity.</li> </ul> </li> </ul> <p>In order to be tested for physical withholding, the above mentioned resources must meet at least one of the following conditions:</p> <ul style="list-style-type: none"> <li>○ If the unmitigated price of a class of <i>operating reserve</i> exceeds \$15/MW, all resources eligible to provide that class of <i>operating reserve</i> will be tested for physical withholding; or</li> <li>○ If the value of a MIN constraint for a reserve area is greater than 0 MW for a class of reserve for that particular reserve area, all resources eligible to provide that class of <i>operating reserve</i> in that reserve area will be tested for physical withholding.</li> </ul> <ul style="list-style-type: none"> <li>• Specify the following exception from the physical withholding tests:                             <ul style="list-style-type: none"> <li>○ resources within a region in which incremental <i>operating reserve</i> of a given class could not be scheduled due to a MAX area reserve constraint;</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <p>Specify that the <i>IESO</i> may apply a conduct test for all resources identified in the section above. If the <i>IESO</i> applies the conduct test, it will determine if the conduct test is failed on the basis of <i>operating reserve offers</i>.</p> <ul style="list-style-type: none"> <li>• Codify the conduct thresholds for physical withholding of <i>operating reserve</i>.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may perform the impact test for physical withholding on resources that meet all the conditions described above and fail any of the conduct test.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>Codify the impact thresholds for physical withholding for <i>operating reserve</i>.</li> </ul> <p><u>Mitigation Application:</u> Specify that if a <i>market participant</i> fails the conduct and impact tests for physical withholding of <i>operating reserve</i>, that <i>market participant</i> will be subject to a <i>settlement</i> charge for each instance of physical withholding. An instance of physical withholding is defined as a single <i>dispatch day</i> on which physical withholding is found to occur per market control entity.</p>
Appendix 7.8, Section 5 NEW	New	Ex-Post Mitigation	<p><u>Economic Withholding on Uncompetitive Interties:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> shall apply the conduct and impact tests for an <i>intertie</i> resource using its <i>intertie</i> reference level, to test for economic withholding on uncompetitive <i>interties</i>.</li> <li>If any <i>market participant</i> fails the conduct and impact tests, obligate the <i>IESO</i> to notify the <i>market participant</i> and allow them 15 <i>business days</i> to make representations regarding the <i>intertie</i> reference level.</li> <li>If the information provided by the <i>market participant</i> changes the initial estimate of the <i>intertie</i> reference level, the <i>IESO</i> will re-run the conduct and impact tests. If the conduct and impact tests fail again in the re-run, that finding will be used to determine any resulting <i>settlement</i> charge.</li> <li>Specify that the <i>IESO</i> shall determine an <i>intertie</i> reference level as follows:                         <ul style="list-style-type: none"> <li>When an <i>intertie</i> resource has been schedule economically by the <i>IESO</i> for at least fifteen of the ninety days previous to the <i>dispatch day</i> being investigated, the <i>intertie</i> reference level will be the offer-based reference price.</li> <li>If the above condition is not met:                                 <ul style="list-style-type: none"> <li>the <i>intertie</i> reference price for <i>energy</i> will be the <i>intertie</i> border price for <i>energy</i> for the relevant <i>dispatch interval</i>.</li> <li>the <i>intertie</i> reference price for <i>operating reserve</i> will be the <i>intertie</i> border price for <i>operating reserve</i> for the relevant <i>dispatch interval</i>.</li> </ul> </li> </ul> </li> </ul> <p><u>Conditions - Energy:</u></p> <ul style="list-style-type: none"> <li>The resource will be eligible for ex-post testing for <i>energy</i> price impact on an uncompetitive <i>intertie</i> if:                         <ul style="list-style-type: none"> <li>there is a positive congestion component for <i>energy</i> on an uncompetitive <i>intertie</i> greater than a threshold value of \$25/MWh.</li> </ul> </li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>○ The <i>energy import offers</i> at <i>offer</i> or <i>export bid</i> prices is above \$25/MWh.</li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may apply a conduct test for all <i>energy import offers</i> identified above to determine if they fail the conduct tests.</li> <li>• Codify conduct thresholds when testing for price impact for <i>energy</i> on uncompetitive <i>interties</i>.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may perform the impact test for all <i>energy import offers</i> or <i>bids</i> that meet the conditions identified above and that fail the conduct test.</li> <li>• Codify impact thresholds that will be applied to test for price impact on uncompetitive <i>interties</i> for <i>energy</i>.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>• Specify that if a <i>market participant</i> fails the conduct and impact tests for economic withholding on an uncompetitive <i>intertie</i>, that <i>market participant</i> will be subject to a <i>settlement</i> charge for each instance of economic withholding. An instance of economic withholding is defined as a single <i>dispatch day</i> on which economic withholding is found to occur on an uncompetitive <i>intertie</i> per market control entity. The <i>settlement</i> charge will be calculated using the MWh quantity that failed the conduct and impact test for economic withholding for a <i>dispatch day</i>, and will be calculated for the day-ahead market and the <i>real-time market</i>. Codify <i>settlement</i> charge formula.</li> </ul> <p><u>Conditions – Operating Reserve:</u></p> <ul style="list-style-type: none"> <li>• The resource will be eligible for ex-post testing for <i>operating reserve</i> price impact on an uncompetitive <i>intertie</i> if:                         <ul style="list-style-type: none"> <li>○ there is an <i>operating reserve</i> price on an uncompetitive <i>intertie</i> greater than a threshold value of \$15/MW.</li> <li>○ <i>operating reserve import offers</i> are <i>offered</i> at prices above \$5/MW.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may apply a conduct test for all <i>operating reserve import offers</i> identified above to determine if they fail the conduct tests.</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<ul style="list-style-type: none"> <li>• Codify conduct thresholds when testing for price impact for <i>operating reserve</i> on uncompetitive <i>interties</i>.</li> </ul> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> may perform the impact test for all <i>operating reserve</i> import offers that meet the conditions identified above and that fail the conduct test.</li> <li>• Codify impact thresholds that will be applied to test for price impact on uncompetitive <i>interties</i> for <i>operating reserve</i>.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>• Specify that if a <i>market participant</i> fails the conduct and impact tests for economic withholding on an uncompetitive <i>intertie</i> for a resource, that <i>market participant</i> will be subject to a <i>settlement</i> charge for each instance of economic withholding. An instance of economic withholding is defined as a single <i>dispatch day</i> on which economic withholding is found to occur on an uncompetitive <i>intertie</i> per market control entity. The <i>settlement</i> charge will be calculated using the MWh quantity that failed the conduct and impact test for economic withholding for a <i>dispatch day</i>, and will be calculated for the day-ahead market and the <i>real-time market</i>. Codify <i>settlement</i> charge formula.</li> </ul>
Appendix 7.8, Section 5 NEW	New	Ex-Post Mitigation	<p><u>Make-Whole Payment Impact on Uncompetitive Interties:</u></p> <ul style="list-style-type: none"> <li>• Specify that in order to be tested for ex-post economic withholding for make-whole payment impact on an uncompetitive <i>intertie</i>, resources must meet at least one of the following conditions:                             <ul style="list-style-type: none"> <li>○ The resource was tested for an <i>energy</i> price impact on an uncompetitive <i>intertie</i>.</li> <li>○ The resource was tested for an <i>operating reserve</i> price impact on an uncompetitive <i>intertie</i>.</li> <li>○ The resource was scheduled to provide <i>operating reserve</i> on an uncompetitive <i>intertie</i> and will otherwise receive a make-whole payment greater than \$10,000.</li> </ul> </li> </ul> <p><u>Conduct Test:</u></p> <ul style="list-style-type: none"> <li>• Specify that the <i>IESO</i> will determine if <i>energy</i> or <i>operating reserve</i> import offers fail the conduct tests; codify the conduct thresholds when testing for</li> </ul>

<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			<p>make-whole payment impact on an uncompetitive <i>intertie</i>.</p> <p><u>Impact Test:</u></p> <ul style="list-style-type: none"> <li>Specify that the <i>IESO</i> may perform the impact test for all <i>energy import offers</i> that meet the conditions identified above and that fail the conduct test. Codify the make-whole payment thresholds.</li> </ul> <p><u>Mitigation Application:</u></p> <ul style="list-style-type: none"> <li>Specify that if a <i>market participant</i> fails the conduct and impact tests for make-whole payment impact on an uncompetitive <i>intertie</i>, that <i>market participant</i> will be subject to a <i>settlement</i> charge. The <i>settlement</i> charge will be the difference between the net make-whole payment for a given transaction and the make-whole payment that would have occurred had the offer-based reference price been used.</li> </ul>
Appendix 7.8, Section 5 NEW	New	Ex-Post Mitigation	<p><u>Ex-Post Mitigation – Procedural Steps and Timelines:</u></p> <ul style="list-style-type: none"> <li>Specify that, when the <i>IESO</i> identifies either physical withholding or economic withholding at uncompetitive <i>interties</i>, the <i>IESO</i> shall apply the mitigation tests to determine if a <i>settlement</i> charge is warranted.</li> <li>If the <i>IESO</i> determines that a <i>settlement</i> charge should be applied, the <i>IESO</i> shall follow the following procedure:                             <ul style="list-style-type: none"> <li>Notify the <i>registered market participant</i> no later than six months after the first instance of either physical or economic withholding on an uncompetitive <i>intertie</i>.</li> <li>The notice will include an estimate of the <i>settlement</i> charge.</li> </ul> </li> <li>Within 15 <i>business days</i> of receiving the notification from the <i>IESO</i>, the <i>registered market participant</i> may make written representations regarding the reference quantity or <i>intertie</i> reference level used to determine the <i>settlement</i> charge.</li> <li>Within three months after the time period specified in the previous step has elapsed, the <i>IESO</i> shall complete its analysis and notify the <i>registered market participant</i> whether it will impose a final <i>settlement</i> charge.</li> </ul> <p>OVERLAP: Offers, Bids and Data Inputs, Grid and Market Operations, Market Settlement, Day-Ahead,</p>



<b>Market Rule Section</b> [Chapter No.], [Section No.]	<b>Type</b>	<b>Topic</b>	<b>Requirement</b>
			Pre-Dispatch and Real-Time Calculation Engines.
Appendix 7.8, Section 6 NEW	New	Settlement Cost Recovery Requests	<p>Section 6 NEW – Settlement Cost Recovery Requests:</p> <ul style="list-style-type: none"> <li>• Specify that a <i>market participant</i> may, in extenuating circumstances where the reference level for financial <i>offers</i> applied in the ex-ante mitigation process are considered inappropriate by the <i>market participant</i>, submit a <i>notice of disagreement</i> in accordance with Sections 6.6, 6.7 and 6.8 in Chapter 9. Such circumstances may include, but are not limited to the following:                             <ul style="list-style-type: none"> <li>○ the <i>market participant</i> owning the <i>facility/resource</i> requested a change to its reference level within a predefined period prior to market scheduling, but the <i>IESO</i> was unable to update the reference level in time; or</li> <li>○ the <i>market participant</i> owning the <i>resource/facility</i> did not request a change to its reference level within a predefined period prior to market scheduling, but believes an incorrect reference level was used.</li> </ul> </li> <li>• Specify that a <i>market participant</i> may submit an ex-post cost recovery request with any supporting documentation as requested by the <i>IESO</i>, for a <i>resource/facility</i> when:                             <ul style="list-style-type: none"> <li>○ the <i>IESO</i> has applied market power mitigation to this <i>resource/facility</i> for all or part of one or more <i>trading days</i>; and</li> <li>○ the <i>market participant</i> believes that the reference level for a financial parameter used during the mitigation process did not reflect the allowable short-run marginal costs the <i>market participant</i> expected to incur.</li> </ul> </li> <li>• Obligate the <i>IESO</i> to determine whether to modify <i>settlement</i> as a result of modifying certain cost components of the financial reference level. Only costs up to the <i>offer</i> price that was current at the time that the relevant scheduling process was carried out shall be eligible for recovery.</li> </ul> <p>OVERLAP: Market Settlement.</p>

– End of Section –

# 5 Procedural and Manual Requirements

## 5.1 Market-Facing Procedural Impacts

The existing *market manuals* related to the Market Power Mitigation process will be retained to the extent possible. The framework for market power mitigation in the future market will differ fundamentally from the process followed today. The *IESO* will establish a new methodology for mitigating the exercise of market power on an ex-ante and an ex-post basis, which will incorporate several new processes.

The new framework for market power mitigation will impact many aspects of market operations. Modifications or additions will be required to most of the market-facing manuals, training materials and *IESO* Supporting Documents. The documents most directly related to the Market Power Mitigation process are:

- Market Manual 1: Market Entry;
- Market Manual 2: Market Administration
- Market Manual 4: Market Operations;
- Market Manual 5: Settlements;
- Market Manual 7: System Operations;
- Market Manual 9: Day-Ahead Commitment; and
- Market Manual 12: Capacity Auctions.

Table 5-1 identifies sections within the *market manuals* that are related but will not require changes, sections that require modification, and new sections that will need to be added to support the Market Power Mitigation process in the future market.

**Table 5-1: Required Updates to Existing Market-Facing Procedures**

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 1 Market Entry, Part 1.2 - Facility Registration, Maintenance, and De-registration	Modification		<ul style="list-style-type: none"> <li>• Reference levels will need to be registered. The registration process will need to be amended to reflect the requirements to register reference levels.</li> <li>• If the Market Assessment and Compliance Division (MACD) is involved in the registration of a reference level, then this procedure will need to be updated to reflect MACD’s involvement in the procedure.</li> </ul>
Market Manual 1 Market Entry, Part 1.2 - Facility Registration, Maintenance, and De-registration	Modification	3 Facility Maintenance	<ul style="list-style-type: none"> <li>• The existing manual content may need to be updated to clarify that the requested change should be an accurate reflection of the physical capabilities of the <i>facility</i>.</li> <li>• The time requirement that specifies how long <i>market participants</i> have to update their reference levels in the event of a change at the <i>facility</i> will need to be added.</li> </ul>

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 2 Market Administration, Part 2.1 - Dispute Resolution	Potential Modification	2.3 Participating in Mediation	<ul style="list-style-type: none"> <li>If mitigation disputes are different from others, this manual will need to be updated.</li> </ul>
Market Manual 2 Market Administration, Part 2.7 - Treatment of Market Surveillance Issues	Modification		<ul style="list-style-type: none"> <li>There are several places in the document that refer to market power investigations. This manual needs to be updated to accurately reference the new market power mitigation framework.</li> </ul>
Market Manual 2 Market Administration, Part 2.12 - Treatment of Local Market Power	Modification		<ul style="list-style-type: none"> <li>This market manual will need to be kept in use to accommodate treatment of legacy local market power or constrained-off watch-zone (COWZ) investigations. It should be modified to note that once the new mitigation framework comes into force, no new local market power COWZ cases can accrue.</li> </ul>
Market Manual 2 Market Administration, Part 2.14 - Information Confidentiality Catalogue	Modification		<ul style="list-style-type: none"> <li>Data that is new to the <i>IESO</i> and to <i>market participants</i> as a result of market power mitigation will need to be appropriately identified in this market manual in terms of what the confidentiality classification of each type of information is and which parties have access to it.</li> </ul>
Market Manual 4 Market Operations, Part 4.2 - Submission of Dispatch data in the Real-Time Energy and Operating Reserve Markets	Modification		<ul style="list-style-type: none"> <li>Offer changes for NQS commitments in PD will be restricted barring occasions when a <i>market participant</i> has requested an increase to a reference level for a higher fuel cost. The relationship between the offer change restriction and a request to increase reference levels needs to be reflected in this manual.</li> </ul>
Market Manual 4 Market Operations, Part 4.2 - Submission of Dispatch data in the Real-Time Energy and Operating Reserve Markets	Modification	2.3.2 Replacement Energy Offers	<ul style="list-style-type: none"> <li>This section will need to be modified to include discussion on what impact this will have on the reference level that will be applied when <i>energy offers</i> are replaced. The potential impact on mitigation will need to be made clear in these circumstances in this section.</li> </ul>

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 4 Market Operations, Part 4.2 - Submission of Dispatch data in the Real-Time Energy and Operating Reserve Markets	Modification	D.4 Publication & Notification of Results	<ul style="list-style-type: none"> <li>Mitigation results may need to be included in the data released to <i>market participants</i> indicated in this section.</li> </ul>
Market Manual 4 Market Operations, Part 4.3 - Real-Time Scheduling of the Physical Markets	Modification	3 Determining Real-Time Schedules	<ul style="list-style-type: none"> <li>Include discussion of market power mitigation inputs in information that the <i>IESO</i> uses to determine <i>real-time schedules</i>.</li> <li>When discussing <i>IESO</i> intervention into real-time <i>dispatch</i>, clarify whether this intervention constitutes a <i>reliability</i> constraint.</li> </ul>
Market Manual 4 Market Operations, Part 4.3 - Real-Time Scheduling of the Physical Markets	Modification	5 Releasing Real-Time and Market Information	<ul style="list-style-type: none"> <li>Automated notifications to <i>market participants</i> about mitigation needs to be included in this section.</li> </ul>
Market Manual 4 Market Operations, Part 4.3 - Real-Time Scheduling of the Physical Markets	Modification	6 Determining Dispatch Instructions	<ul style="list-style-type: none"> <li>Operator actions to manually create schedules that are <i>reliability</i> constraints will need to be specified in this section.</li> </ul>
Market Manual 4 Market Operations, Part 4.6 - Real-Time Generation Cost Guarantee Program	Modification		<ul style="list-style-type: none"> <li>If this manual is updated to reflect the enhanced PD commitment program rather than the current RT GCG, then this manual needs to describe mitigation of PD commitments where necessary.</li> </ul>
Market Manual 5 Settlements, Part 5.5 - Physical Markets Settlement Statements	Modification	1.6.1 Special Settlement Activities	<ul style="list-style-type: none"> <li>The <i>IESO</i> might need to reflect the description of the make-whole payment mitigation process carried out by <i>settlements</i> in this section unless this process is described in the market manual sections relevant to each specific type of make-whole payment.</li> </ul>

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 7 System Operations, Part 7.1 - IESO-Controlled Grid Operating Procedures	Modification		<ul style="list-style-type: none"> <li>This manual needs to reflect that when an operator initiates a constraint that is a <i>reliability</i> constraint, the resource will be tested for mitigation using the <i>reliability</i> constraint conduct and impact thresholds.</li> <li>Each occurrence in the manual where it states that the action is to manually constrain a supply resource needs to specify whether this constraint will be marked as a <i>reliability</i> commitment and tested for mitigation as a result.</li> <li>It needs to be made clear whether mitigation for <i>reliability</i> constraints will be carried out under all operating states or if there are exceptions for abnormal operating states.</li> </ul>
Market Manual 7 System Operations, Part 7.4 - IESO-Controlled Grid Operating Policies	Modification		<ul style="list-style-type: none"> <li>This manual needs to reflect that when an operator initiates a constraint that is a <i>reliability</i> constraint, the resource will be tested for mitigation using the <i>reliability</i> constraint conduct and impact thresholds.</li> <li>Each occurrence in the manual where it states that the “action” is to manually constrain a supply resource needs to specify whether this constraint will be marked as a <i>reliability</i> commitment and tested for mitigation as a result.</li> <li>It needs to be made clear whether mitigation for <i>reliability</i> constraints will be carried out under all operating states or if there are exceptions for abnormal operating states.</li> </ul>
Market Manual 7 System Operations, Part 7.6 - Glossary of Standard Operating Terms	Modification		<ul style="list-style-type: none"> <li>The <i>IESO</i> may need to include <i>reliability</i> constraint in the glossary of terms.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.0 - DACP Overview	Modification	2.3 Who Should Use This Manual	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the fact that <i>market participants</i> will be expected to review reference levels, request increases to them where necessary and submit supporting information when such requests are submitted.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.0 - DACP Overview	Modification	3 About the Day-Ahead Commitment Process	<ul style="list-style-type: none"> <li>This section will need to be updated to accurately describe the interaction between the mitigation process and the day-ahead scheduling process.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.0 - DACP Overview	Modification	4 Procedures Summary	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the market power mitigation procedures that are related and/or triggered by the procedures in the DAM.</li> </ul>

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 9 Day-Ahead Commitment, Part 9.0 - DACP Overview	Modification	5 Applicability of Procedures	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the mitigation procedures that can be carried out in the context of the DAM.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.1 - Submitting Registration Data for the DACP	Modification	4 Overview of Submission of Registration Data	<ul style="list-style-type: none"> <li>This manual will need to be updated to reflect the need for <i>market participants</i> to review and request necessary changes to reference levels. It also will need to be updated to make clear the relationship between registered data for operating parameters such as MLP, MGBRT etc. and the ability to submit values for these parameters that vary from the relevant registered reference levels.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.1 - Submitting Registration Data for the DACP	Modification	5 Procedures for Submitting DACP Registration Data	<ul style="list-style-type: none"> <li>This section may need to be updated to include discussion and description of the process to review reference levels and request changes to reference levels where necessary.</li> <li>It may be necessary to significantly increase content on the descriptions for each of the parameter to make clear the difference between a registered value for these parameters and the value that is offered by the <i>market participant</i> for each of these values. For example, for MLP, the registered value is based on physical characteristics, whereas the offer can be anything below the allowed value (dependent on the reference level and conduct threshold.)</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.2 - Submitting Operational and Market Data for the DACP	Modification	4 Overview of Submitting Operational and Market Data	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the need to maintain reference levels and carry out any changes necessary to reference levels prior to the close of the DAM offer window.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.2 - Submitting Operational and Market Data for the DACP	Modification	5 Submitting Operational and Market Data for the DACP	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the need to maintain reference levels and carry out any changes necessary to reference levels prior to the close of the DAM offer window.</li> <li>This section will also need to describe how the reference level in special cases will be determined (start offers for late hour starts, fast-start resources, <i>pseudo units</i> etc.)</li> <li>Additionally, this section will need to make it clear which parameters are mitigated through validation and which parameters are mitigated via conduct and impact testing. That way participants will know when <i>offers</i> will be rejected in advance rather than after they are mitigated by the engine.</li> </ul>

Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 9 Day-Ahead Commitment, Part 9.2 - Submitting Operational and Market Data for the DACP	Modification	5.3 Requesting Segregated Mode of Operation (SMO)	<ul style="list-style-type: none"> <li>This section needs to be updated to note what the treatment of SMO will be for the purposes of assessing physical withholding.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Modification	4.1.5 Treatment of MGBDT over Midnight	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect that if <i>market participants</i> remove <i>offers</i> to ensure that the MGBDT is not violated by the dispatch engine, they are not at risk of being found to have physically withheld for those resources for those hours.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Modification	4.3 Optimization Process Overview	<ul style="list-style-type: none"> <li>This section needs to be updated to include details of how and when mitigation will be assessed in the dispatch engine.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Modification	4.6 IESO Reliability Commitment Actions	<ul style="list-style-type: none"> <li>This section needs to be updated to accurately describe which of these actions results in “<i>reliability</i> constraints” which will be tested for market power mitigation using the <i>reliability</i> conduct and impact thresholds.</li> <li>It should also be updated to make clear which of these constraints impacts DA schedules and which ones are only reflected in the PD.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Modification	4.8 DACP Reports	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect which reports based on mitigation will be published out of the DAM.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Modification	4.12 Notification of Reliability Commitments	<ul style="list-style-type: none"> <li>This section needs to be updated to accurately describe which of these actions results in <i>reliability</i> constraints which will be tested for market power mitigation using the <i>reliability</i> conduct and impact thresholds.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	Potential Modification	Appendix A: Detailed IHO Calculation	<ul style="list-style-type: none"> <li>This section may need to be updated to reflect treatment of mitigation for late-day starts. It is unknown at this point if this IHO process will be unchanged and the extent to which it is impacted by mitigation.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.4 - Real-Time Integration of the DACP	Modification	4.1.1 Reliability Constraints	<ul style="list-style-type: none"> <li>This section needs to be updated to accurately describe which of these actions results in <i>reliability</i> constraints which will be tested for market power mitigation using the <i>reliability</i> conduct and impact thresholds.</li> <li>It should also likely be updated to make it clear which of these constraints results in DA schedules and which ones are only reflected in the PD.</li> </ul>



Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 9 Day-Ahead Commitment, Part 9.4 - Real-Time Integration of the DACP	Modification	4.2 De-commitment and Withdrawal	<ul style="list-style-type: none"> <li>This section will need to be updated to reflect the potential impact of withdrawal/de-commitment on assessment of physical withholding.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.4 - Real-Time Integration of the DACP	Modification	4.6 Synchronize Units Committed in the Day-Ahead	<ul style="list-style-type: none"> <li>This section needs to be updated to reflect the fact that failing to synchronize for a DA commitment can impact the assessment of physical withholding.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.4 - Real-Time Integration of the DACP	Modification	5.1 Withdraw Offers for a Committed Resource; 5.2 Respond to IESO Request for De-commitment - Procedure	<ul style="list-style-type: none"> <li>These sections need to list the circumstances that will lead to increased exposure for assessment of physical withholding.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	4 Derived Internal Price Curve	<ul style="list-style-type: none"> <li>This section needs to be updated to include description of how the IESO will construct the derived internal reference price curve for <i>pseudo units</i>.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	5 Day-Ahead Production Cost Guarantee	<ul style="list-style-type: none"> <li>This section may need to be updated to describe how the make whole payment mitigation will be applied for DAM schedules given the fact that there are dependencies between the DA schedule, RT operations and whether the resource is paid a MWP.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	6 Day-Ahead Fuel Cost Compensation Due to De-commitment	<ul style="list-style-type: none"> <li>This section may need to be updated to reflect any changes based on mitigation. If the Fuel Cost Compensation (FCC) process does not change, then the section can likely stay the same. If the FCC process needs to be updated to account for potential mitigation of the fuel cost offer that the commitment was based on, then the content in this section will need to reflect the updated process including any new discussions of reference level.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	7 Day-Ahead Generator Withdrawal Charge	<ul style="list-style-type: none"> <li>This section needs to be updated to address exposure to findings of physical withholding if a <i>generation unit</i> committed in the DAM does not produce in the RTM.</li> </ul>



Procedure	Type of change (no change, modification, new)	Section	Description
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	Appendix B: DIPC Formulation	<ul style="list-style-type: none"> <li>This section will need to be updated to include any specific details of how the derived internal reference price curve will be derived or treated.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification	Appendix B: DIGQ Formulation	<ul style="list-style-type: none"> <li>This section will need to be assessed to determine if it needs to be updated to account for the fact that the <i>IESO</i> will be deriving internal reference price curves for <i>pseudo units</i>.</li> </ul>
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	Modification		<ul style="list-style-type: none"> <li>It will need to be determined if this process has similar informational requirements about <i>generation facilities</i> as the process to determine reference levels for non-financial parameters of <i>generation facilities</i>.</li> <li>If there is cross-over and this procedure is the one that the <i>IESO</i> uses to get reference level information from <i>generation facilities</i>, then this manual needs to be updated to reflect that the <i>IESO</i> will use this information for the purpose of determining reference levels in addition to the current <i>reliability</i> compliance purpose.</li> <li>If this information is entirely different than that used to determine reference levels, then this manual should be updated to explicitly state that this information is separate and distinct from the process to determine reference levels.</li> </ul>
Market Manual 12 Capacity Auctions, Part 12.0 - Demand Response Auction	Modification	3.5.2 Reference Price	<ul style="list-style-type: none"> <li>This section should be updated to make it clear that it is not related to the reference levels used for market power mitigation.</li> </ul>
Reference Levels - New Market Manual	New		<ul style="list-style-type: none"> <li>This will be a new manual that will provide <i>market participants</i> with information about what costs are eligible to include when determining reference levels, how the <i>IESO</i> will determine reference levels, and how participants can request changes, etc.</li> </ul>
Market Power Mitigation - New Manual	New		<ul style="list-style-type: none"> <li>This will be a new manual that will provide participants with information about how the <i>IESO</i> will carry out mitigation.</li> </ul>

## 5.2 Internal Procedural Impacts

Many of the internal procedures currently used by the Market Power Mitigation process will be impacted due to the changes to the new market power mitigation methodology.

Some of the internal procedures are related to other *IESO* processes that interact with the Market Power Mitigation process. The changes to the Market Power Mitigation process under the MRP will impact all the internal manuals that address these related areas. In addition, some areas of the current

procedures heavily reference relevant *market rules* and supporting tools, many of which will be undergoing changes as a result of the new *day-ahead market* implementation and other solution enhancements. The existing procedures will be updated to account for the corresponding changes in the market rules and tools. Additionally, new internal procedures to support the mitigation framework under MRP will be created.

Changes or additions to internal *IESO* procedures are for internal *IESO* use, and are not included in the published detailed design. Appendix B details the impacts to internal procedures in terms of existing procedures that support the new market requirements, existing procedures that need to be updated, and new internal procedures that need to be created to support the new market.

**– End of Section –**

# 6 Business Process and Information Flow Overview

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## 6.1 Market-Facing Process Impacts

This section provides an overview to the arrangement of processes required to support the Market Power Mitigation process and activities, and the information flows between them.

The context diagrams presented in Section 2 of this document are considered as level 0 data flow diagrams and represent the major flows of market power mitigation related information into and out of the following market facing processes:

- Submit Market Data;
- Day-Ahead Market Calculation Engine;
- Pre-Dispatch Calculation Engine;
- Real Time Calculation Engine;
- Settlement;
- Ex-Post Mitigation for Physical Withholding;
- Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties;
- Designate Narrow Constrained Areas;
- Designate Dynamic Constrained Areas;
- Designate Uncompetitive Interties; and
- Determine Cost Based Reference Levels.

This section presents the integration of market power mitigation activities in these processes at the next level of detail (level 1). A further break-down of these processes falls into the realm of systems design and is beyond the scope of this document.

The data flow diagram does not illustrate:

- the flow of time or sequence of events (as might be illustrated in a timeline diagram);
- decision rules (as might be illustrated in Flowchart); and
- the logical architecture and the systems architecture (as might be illustrated in a Logical Application and Data Design, and/or Physical Application and Data Design).

However, it does illustrate a logical breakdown of the activities that support the mitigation of market power. Specifically, the data flow diagrams presented below illustrate:

- the mitigation of market power activities;
- the key information flows between each of the activities;
- external sources of key information required for the mitigation of market power activities;
- external destinations of key information from the mitigation activities; and

- the logical boundaries of the mitigation of market power activities as illustrated in the context diagram presented in Section 2 of this document.

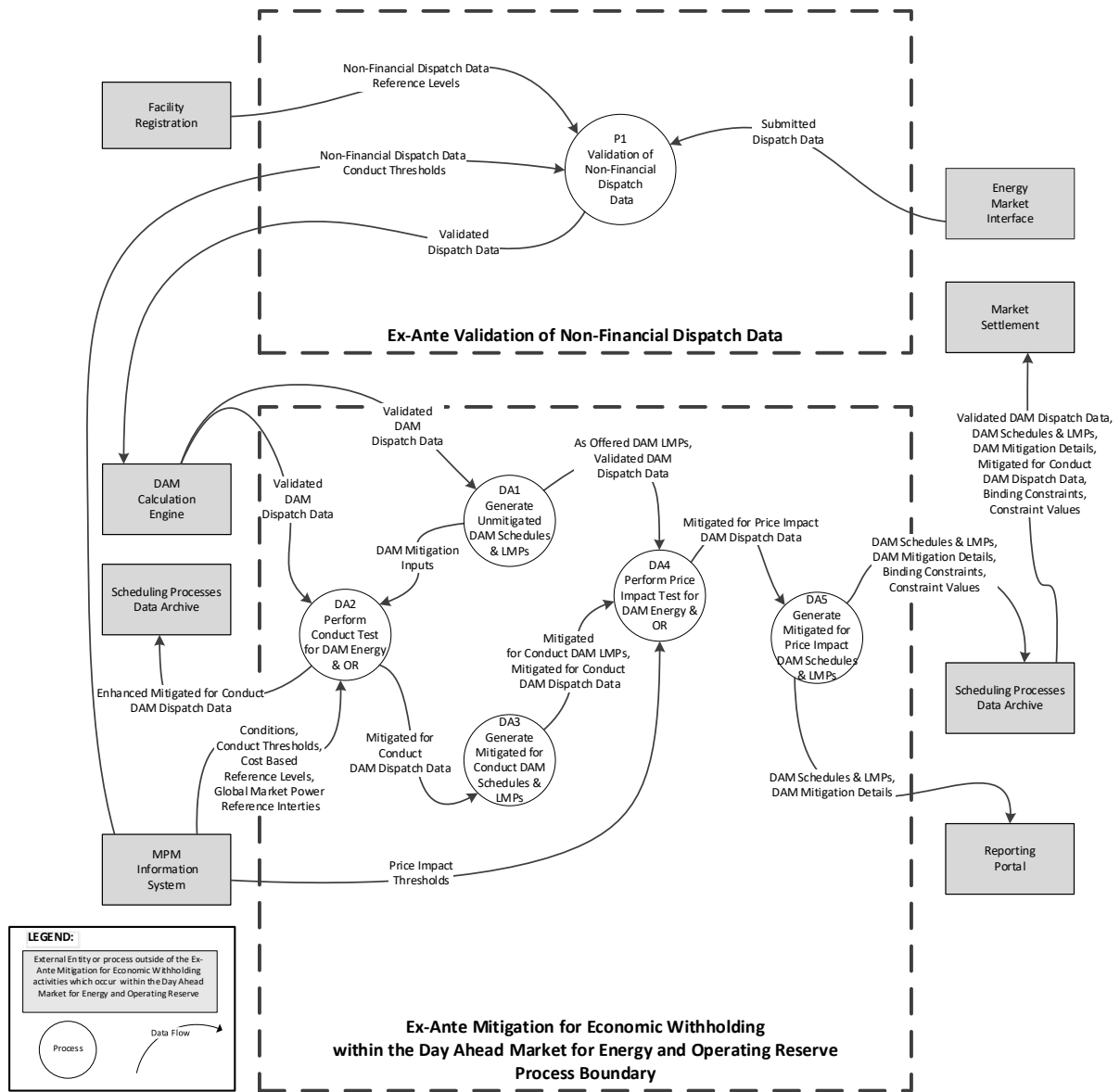
This section is not meant to impart information systems or technology architecture, but rather to capture the mitigation of market power activities as a series of interrelated processes.

The functional design outlined in Section 3 of this document maps to the business process overview presented in this section. In any areas where there are inconsistencies between this section and the description of the business process provided in Section 3, the business process described in Section 3 will take precedence.

The following figures illustrate the data flow diagrams:

- Figure 6-1 and Figure 6-2 present the Ex-Ante Validation of Non-Financial Dispatch Data and the Ex-Ante Mitigation for Economic Withholding in the Day-Ahead Market for Energy and Operating Reserve Data Flow Diagram.
- Figure 6-3 presents the Ex-Ante Mitigation for Economic Withholding in the Pre-Dispatch and Real Time Markets for Energy and Operating Reserve Data Flow Diagram.
- Figure 6-4 presents the Mitigation of Make-Whole Payments within Market Settlement Process Data Flow Diagram.
- Figure 6-5 presents the Ex-Post Mitigation for Physical Withholding in Energy and Operating Reserve Data Flow Diagram.
- Figure 6-6 presents the Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties Data Flow Diagram.
- Figure 6-7 presents the Designate Narrow Constrained Areas Data Flow Diagram.
- Figure 6-8 presents the Designate Dynamic Constrained Areas Data Flow Diagram.
- Figure 6-9 presents the Designate Uncompetitive Interties Data Flow Diagram.
- Figure 6-10 presents the Determine Cost Based Reference Levels Data Flow Diagram.
- Figure 6-11 presents the Settlement Mitigation of Request to Use Higher Cost Fuel Data Flow Diagram.

## 6.2 Ex-Ante Validation of Non-Financial Dispatch Data



**Figure 6-1: Ex-Ante Mitigation for Economic Withholding in the Day-Ahead Market for Energy and Operating Reserve Data Flow Diagram**

### 6.2.1 Process P1: Validation of Non-Financial Dispatch Data

#### Description

Within the Submit Market Data process, hourly and daily *dispatch data* is validated. If any submitted non-financial *dispatch data* value exceeds its conduct threshold, the submitted *dispatch data* will be rejected at the time of submission.

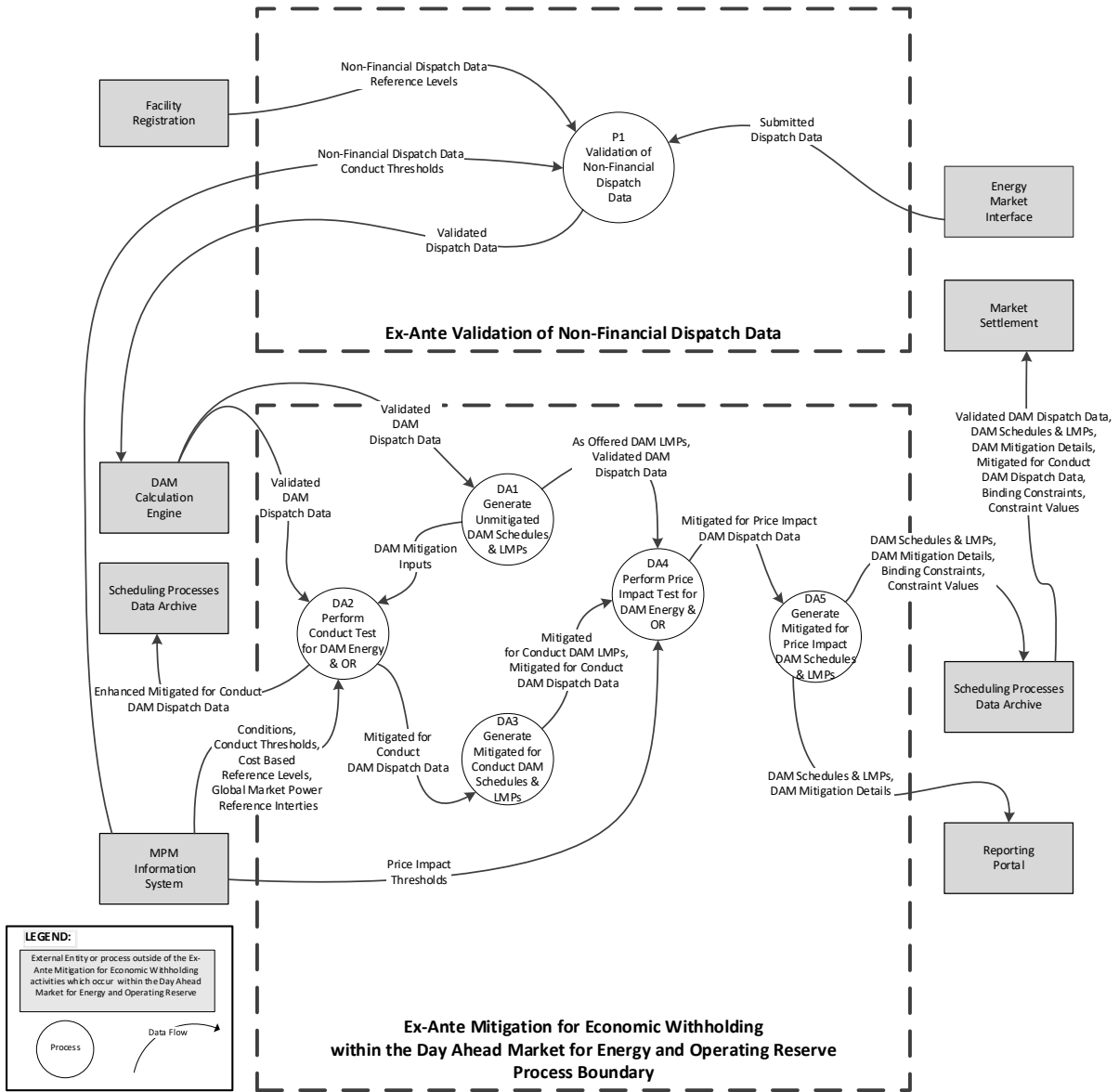
## Input and Output Data Flows

**Table 6-1: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Non-Financial Dispatch Data Reference Levels	Facility Registration	Process P1	Event-based
<p><b>Description:</b></p> <p>Non-financial <i>dispatch data</i> reference levels are <i>facility registration</i> parameters maintained in the Facility Registration system. The non-financial <i>dispatch data</i> reference levels are the following:</p> <ul style="list-style-type: none"> <li>• <i>Minimum generation block run-time</i> (MGBRT) reference level;</li> <li>• <i>Minimum generation block down time</i> (MGBDT) reference level (hot, warm, cold);</li> <li>• <i>Minimum loading point</i> (MLP) reference level;</li> <li>• <i>Energy ramp rate</i> reference level;</li> <li>• <i>Operating reserve ramp rate</i> reference level;</li> <li>• Lead time reference level (hot, warm, cold);</li> <li>• Ramp hours to <i>minimum loading point</i> reference level;</li> <li>• <i>Energy per ramp hour</i> reference level; and</li> <li>• Maximum number of starts per day reference level.</li> </ul>			
Flow	Source	Target	Frequency
Non-Financial Dispatch Data Conduct Thresholds	MPM Information System	Process P1	<i>Market rules</i> -based On update of conduct threshold values
<p><b>Description:</b></p> <p>Conduct thresholds will be established in the <i>market rules</i> and will be applied to the validation of <i>dispatch data</i>. The conduct thresholds are listed in Table 3-4: Conduct Thresholds for Non-Financial Dispatch Data.</p>			
Flow	Source	Target	Frequency
Submitted Dispatch Data	Energy Market Interface	Process P1	As needed.

<p><b>Description:</b></p> <p><i>Market participant-submitted dispatch data</i> may include the following non-financial <i>dispatch data</i> parameters subject to ex-ante market power validation:</p> <ul style="list-style-type: none"> <li>• Hourly <i>dispatch data</i>:             <ul style="list-style-type: none"> <li>○ <i>Energy</i> ramp rates; and</li> <li>○ <i>Operating reserve</i> ramp rates.</li> </ul> </li> <li>• Daily <i>dispatch data</i>:             <ul style="list-style-type: none"> <li>○ MGBRT;</li> <li>○ MGBDT;</li> <li>○ MLP;</li> <li>○ Lead time;</li> <li>○ Ramp hours to MLP;</li> <li>○ <i>Energy</i> per ramp hour; and</li> <li>○ <i>Maximum number of starts per day</i>.</li> </ul> </li> </ul>			
Flow	Source	Target	Frequency
Validated Dispatch Data	Process P1	DAM Calculation Engine, PD Calculation Engine, RT Calculation Engine	Event-based. Upon submission of <i>dispatch data</i> .
<p><b>Description:</b></p> <p><i>Dispatch data</i> that passes ex-ante validation is made available to the DAM, PD, and RT calculation engines. This <i>dispatch data</i> will include the following parameter data according to resource type.</p> <ul style="list-style-type: none"> <li>• Hourly and daily <i>dispatch data</i> passing ex-ante market power validation;</li> <li>• Financial <i>dispatch data</i> parameters subject to ex-ante mitigation and <i>settlement</i> mitigation for economic withholding including:             <ul style="list-style-type: none"> <li>○ <i>Energy offer</i>;</li> <li>○ Start-up <i>offer</i>;</li> <li>○ Speed no-load <i>offer</i>; and</li> <li>○ <i>Operating reserve offer</i>.</li> </ul> </li> <li>• Other validated daily and hourly <i>dispatch data</i> parameters according to resource type.</li> </ul> <p>Reference: Tables 3-1 and 3-5 in the Offers, Bids and Data Input detailed design document.</p>			

### 6.3 Ex-Ante Mitigation for Economic Withholding in the Day-Ahead Market for Energy and Operating Reserve



**Figure 6-2: Ex-Ante Mitigation for Economic Withholding in the Day-Ahead Market for Energy and Operating Reserve Data Flow Diagram.**



### 6.3.1 Process DA1: Generate Unmitigated DAM Schedules and LMPs

#### Description

Process DA1 generates optimized *energy* and *operating reserve* DAM schedules and locational marginal prices (LMPs). The schedules and LMPs produced by Process DA1 are based on validated, but unmitigated DAM *energy* and *operating reserve dispatch data*. The LMPs produced by this process are referred to as the “as-offered LMPs”. The outputs of Process DA1 enable the real-time conduct and price impact tests. The outputs of this process are not communicated to *market participants*.

#### Input and Output Data Flows

**Table 6-2: Process DA1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Validated DAM Dispatch Data	DAM Calculation Engine	Process DA1	Daily/Once per engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The validated DAM <i>dispatch data</i> refers to the set of <i>dispatch data</i> consumed by the DAM calculation engine, which includes both hourly and daily <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>.</li> <li>Validated DAM <i>dispatch data</i> must have successfully passed the validation of non-financial <i>dispatch data</i> and financial <i>dispatch data</i>, but would not have been subjected to the market power mitigation conduct and price impact tests.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			
Flow	Source	Target	Frequency
As-Offered DAM LMPs, Validated DAM Dispatch Data	Process DA1	Process DA4	Daily/Once per engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The as-offered DAM LMPs and schedules for <i>energy</i> and <i>operating reserve</i> are generated based on validated, but unmitigated DAM <i>dispatch data</i>. These are outputs of the initial run of the DAM calculation engine. The as-offered LMPs for <i>energy</i> and <i>operating reserve</i> are used in the price impact test which is described in Process DA5.</li> <li>Process DA1 passes the validated DAM <i>dispatch data</i> to the impact test (Process DA4).</li> </ul>			
Flow	Source	Target	Frequency
DAM Mitigation Inputs	Process DA1	Process DA2	Daily/Once per engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>DAM mitigation inputs include the most restrictive competition category that occurred in each hour. For example, the NCA and DCA binding constraints that occurred in each hour are provided to the conduct test (i.e. Process DA2).</li> </ul>			

## 6.3.2 Process DA2: Perform Conduct Test for DAM Energy and OR

### Description

Process DA2 carries out the conduct test and outputs the mitigated *dispatch data* that was subject to the conduct test. This *dispatch data* set is referred to as mitigated for conduct DAM *dispatch data*.

The conduct test determines if any of the *dispatch data* parameters submitted by a *market participant* for a resource deviates from its respective reference level by more than a specified conduct threshold. When the conduct test is failed, the *dispatch data* values that exceeded the conduct thresholds are substituted with their reference levels for the purpose of determining schedules, prices and make-whole payments.

### Input and Output Data Flows

Table 6-3: Process DA2 Input and Output Data Flows

Flow	Source	Target	Frequency
Validated DAM Dispatch Data	DAM Calculation Engine	Process DA2	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The validated DAM <i>dispatch data</i> as described in DA1.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Thresholds, Cost Based Reference Levels, Conditions, Global Market Power Reference Interties	MPM Information System	Process DA2	Cost-Based Reference Levels; daily frequency. Conduct Thresholds; only when updated. Conditions; only when updated.

<p><b>Description:</b></p> <p>The conduct test requires conduct thresholds, cost-based reference levels for each resource, conditions for mitigation and designated constrained areas, and the list of Global Market Power Reference Interties. Details regarding conduct thresholds may be found in Section 3.6.</p> <p>This data flow includes the following:</p> <ul style="list-style-type: none"> <li>• Conduct Thresholds for Price Impact Testing for NCAs and DCAs (Table 3-5);</li> <li>• Conduct Thresholds for Price Impact Testing for BCAs (Table 3-7);</li> <li>• Conduct Thresholds for Price Impact Testing for Global Market Power – Energy (Table 3-9);</li> <li>• Conduct Thresholds for Price Impact Testing for Local Market Power – Operating Reserve (Table 3-11);</li> <li>• Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve (Table 3-13);</li> <li>• Cost-Based Reference Levels: Details regarding cost-based reference levels as found in Section 3.13.1.2;</li> <li>• The conditions for mitigation as found in Section 3.4.2;</li> <li>• Details of resources designated as either NCA or DCA and the designated NCA or DCA transmission constraints that the conduct test requires as found in Section 3.12; and</li> <li>• Details of Global Market Power Reference Interties: At this time, the <i>IESO</i> considers the New York-Ontario <i>intertie</i> and the Michigan-Ontario <i>intertie</i> to be the Global Market Power Reference Interties.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct DAM Dispatch Data	Process DA2	Process DA3	Daily/Once per DAM calculation engine run.
<p><b>Description:</b></p> <p>Mitigated for conduct DAM <i>dispatch data</i> is the <i>energy</i> and <i>operating reserve dispatch data</i> utilized by the DAM calculation engine, which includes:</p> <ul style="list-style-type: none"> <li>• Financial <i>dispatch data</i> parameters that failed the conduct test and were mitigated to their reference level values; and</li> <li>• Financial <i>dispatch data</i> parameters that passed the conduct test and their as-submitted values were used.</li> </ul>			
Flow	Source	Target	Frequency
Enhanced Mitigated for Conduct DAM Dispatch Data	Process DA2	Scheduling Processes Data Archive	Daily/Once per DAM calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The enhanced mitigated for conduct <i>dispatch data</i> is the additional mitigated for conduct <i>energy</i> and <i>operating reserve dispatch data</i> that is not used by the DAM calculation engine to establish schedules and LMPs, but is created by the engine for certain NQS resources using the most restrictive constraint conditions over the NQS commitment period, regardless of active binding transmission.</li> <li>• This mitigated <i>dispatch data</i> is saved in Scheduling Process Data Archive for future use in the <i>settlement</i> mitigation of make-whole payments process.</li> </ul>			
Flow	Source	Target	Frequency
DAM Mitigation Inputs	Process DA1	Process DA2	Daily/Once per DAM calculation engine run.

**Description:**

- DAM mitigation inputs include the most restrictive competition category that occurred in each hour. For example, the NCA and DCA binding constraints that occurred in each hour are provided to the conduct test.

### 6.3.3 Process DA3: Generate Mitigated for Conduct DAM Schedules and LMPs

#### Description

Process DA3 generates schedules and LMPs based on *energy* and *operating reserve dispatch data* that was consumed by the DAM calculation engine and was subject to the conduct test (i.e. outputs mitigated for conduct *dispatch data*). The LMPs and schedules produced by this process are referred to as mitigated for conduct DAM schedules and LMPs.

#### Input and Output Data Flows

**Table 6-4: Process DA3 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Conduct DAM Dispatch Data	Process DA2	Process DA3	Daily/Once per DAM calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Mitigated for conduct DAM <i>dispatch data</i> is used in the calculation of mitigated for conduct DAM <i>energy</i> and <i>operating reserve</i> LMPs. It is as described in process DA2.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct DAM LMPs, Mitigated for Conduct DAM Dispatch Data	Process DA3	Process DA4	Daily/Once per DAM calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The mitigated for conduct DAM LMPs for <i>energy</i> and <i>operating reserve</i> are generated by the DAM calculation engine based on <i>dispatch data</i> that was consumed by the engine and was subject to the conduct test. This data is the output of the second run of the DAM calculation engine (Process DA3).</li> <li>Mitigated for conduct DAM <i>dispatch data</i> is as described in Process DA2. Process DA3 passes the mitigated for conduct DAM <i>dispatch data</i> to the price impact test (Process DA4).</li> </ul>			

### 6.3.4 Process DA4: Perform Price Impact Test for DAM Energy and OR

#### Description

Process DA4 carries out the price impact test for *energy* and *operating reserve*. The price impact test compares the as-offered DAM LMPs to the mitigated for conduct DAM LMPs and applies the price impact thresholds. Process DA4 outputs *dispatch data* that was subject to the price impact test (i.e. outputs mitigated for price impact *dispatch data*). The price impact mitigation process is described in detail in Section 3.6.

#### Input and Output Data Flows

Table 6-5: Process DA4 Input and Output Data Flows

Flow	Source	Target	Frequency
As-Offered DAM LMPs, Validated DAM Dispatch Data	Process DA1	Process DA4	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The as-offered DAM LMPs are an input to the price impact test and are described in process DA1.</li> <li>The validated DAM <i>dispatch data</i>, as defined in process DA1, is required to derive the mitigated for price impact DAM <i>dispatch data</i>.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct DAM LMPs, Mitigated for Conduct DAM Dispatch Data	Process DA3	Process DA4	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The mitigated for conduct DAM LMPs for <i>energy</i> and <i>operating reserve</i> are an input into the price impact test.</li> <li>The mitigated for conduct DAM <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>, as described in process DA2, is required to produce mitigated for price impact DAM <i>dispatch data</i> in this process.</li> </ul>			
Flow	Source	Target	Frequency
Price Impact Thresholds	MPM Information System	Process DA4	Event-based. Whenever a threshold value is changed.

<p><b>Description:</b></p> <p>Details regarding price impact thresholds may be found in Section 3.6, and are indicated below:</p> <ul style="list-style-type: none"> <li>• Price Impact Thresholds for NCAs and DCAs (Table 3-6);</li> <li>• Price Impact Threshold for BCAs (Table 3-8);</li> <li>• Price Impact Threshold for Global Market Power – Energy (Table 3-10);</li> <li>• Price Impact Threshold for Local Market Power – Operating Reserve (Table 3-12); and</li> <li>• Price Impact Threshold for Global Market Power – Operating Reserve (Table 3-14).</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Price Impact DAM Dispatch Data	Process D4	Process D5	Daily/Once per calculation engine run.
<p><b>Description:</b></p> <p>The outcome of the price impact test determines if mitigated for DAM conduct <i>dispatch data</i> or unmitigated <i>dispatch data</i> (i.e. validated DAM <i>dispatch data</i>) for <i>energy</i> and <i>operating reserve</i> is provided to Process DA5 to determine final DAM LMPs and schedules.</p> <p>Mitigated for price impact DAM <i>dispatch data</i> includes <i>energy</i> and <i>operating reserve</i>:</p> <ul style="list-style-type: none"> <li>• Financial <i>dispatch data</i> values that failed the price impact test and were mitigated to their reference levels;</li> <li>• Financial <i>dispatch data</i> values that passed the price impact test and were not altered (i.e., as-submitted); and</li> <li>• Validated non-financial <i>dispatch data</i>.</li> </ul> <p>The mitigated for price impact DAM <i>dispatch data</i> is provided to Process DA5.</p>			

### 6.3.5 Process DA5: Generate Mitigated for Price Impact DAM Schedules and LMPs

#### Description

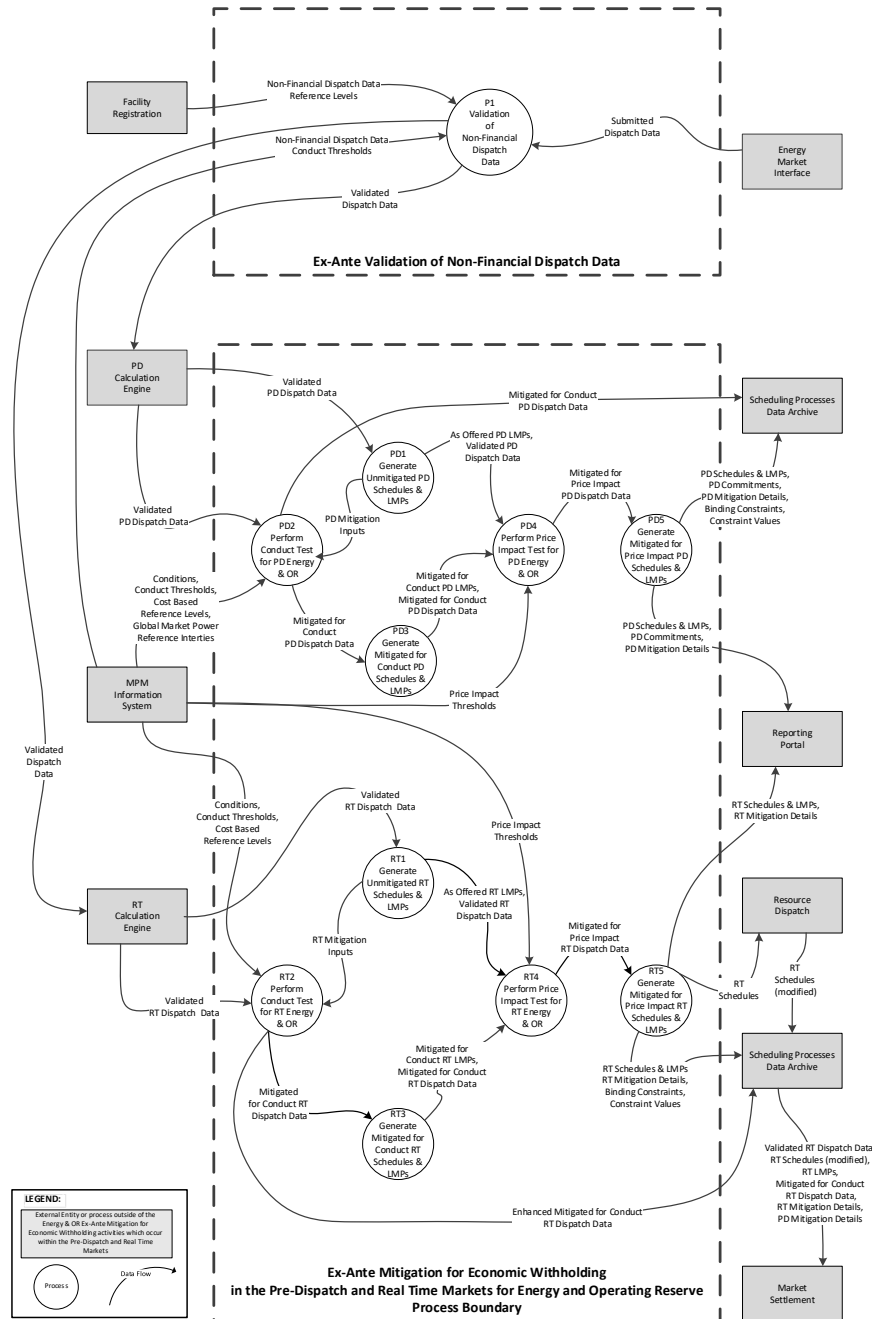
Process DA5 generates optimized *energy* and *operating reserve* DAM LMPs and schedules based on the *dispatch data* that was subject to the price impact test in the DAM calculation engine. The outputs of this process are communicated to *market participants*.

#### Input and Output Data Flow

**Table 6-6: Process DA5 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Price Impact DAM Dispatch Data	Process DA4	Process DA5	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>Mitigated for price impact DAM <i>dispatch data</i>, as defined in DA4, is used to generate DAM <i>energy</i> and <i>operating reserve</i> LMPs and schedules.</li> </ul>			
Flow	Source	Target	Frequency
DAM Schedules and LMPs, DAM Mitigation Details, Binding Constraints, Constraint Values	Process DA5	Scheduling Processes Data Archive	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The outputs of the DAM calculation engine are saved in Scheduling Process Data Archive for future use.</li> </ul>			
Flow	Source	Target	Frequency
DAM Schedules and LMPs, DAM Mitigation Details	Process DA5	Reporting Portal	Daily/Once per DAM calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>Details regarding DAM schedules, LMPs and mitigation activities are made available to the <i>market participant</i> submitting the <i>dispatch data</i>.</li> </ul>			

# 6.4 Ex-Ante Mitigation for Economic Withholding in the Pre-Dispatch and Real Time Market for Energy and Operating Reserve



**Figure 6-3: Mitigation for Economic Withholding in the Pre-Dispatch and Real-Time Markets Data Flow Diagram**



### 6.4.1 Process PD1: Generate Unmitigated PD Schedules and LMPs

#### Description

Process PD1 generates optimized *energy* and *operating reserve* PD schedules and locational marginal prices (LMPs). The schedules and LMPs produced by Process PD1 are based on validated, but unmitigated PD *energy* and *operating reserve dispatch data*. The LMPs produced by this process are referred to as the as-offered PD LMPs. The outputs of Process PD1 enable the PD conduct and price impact tests. The outputs of this process are not communicated to *market participants*.

#### Input and Output Data Flows

**Table 6-7: Process PD1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Validated PD Dispatch Data	PD Calculation Engine	Process PD1	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The validated PD <i>dispatch data</i> refers to the set of <i>dispatch data</i> consumed by the PD calculation engine, which includes both hourly and daily <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>. Validated PD <i>dispatch data</i> must have successfully passed the validation of non-financial <i>dispatch data</i> and financial <i>dispatch data</i>, not subjected to the market power mitigation conduct and price impact tests.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			
Flow	Source	Target	Frequency
As-Offered PD LMPs, Validated PD Dispatch Data	Process PD1	Process PD4	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The as-offered PD LMPs and schedules for <i>energy</i> and <i>operating reserve</i> are generated based on validated, but unmitigated PD <i>dispatch data</i>. These are outputs of the initial run of the PD calculation engine. The as-offered LMPs for <i>energy</i> and <i>operating reserve</i> are used in the price impact test, which is described in Process PD5.</li> <li>Process PD1 passes the validated PD <i>dispatch data</i> to the impact test (Process PD4).</li> </ul>			
Flow	Source	Target	Frequency
PD Mitigation Inputs	Process PD1	Process PD2	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>PD mitigation inputs include the most restrictive competition category that occurred in each hour. For example, the NCA and DCA binding constraints that occurred in each hour are provided to the conduct test (Process PD2).</li> </ul>			

## 6.4.2 Process PD2: Perform Conduct Test for PD Energy and OR

### Description

Process PD2 carries out the conduct test and outputs the mitigated *dispatch data* that was subject to the conduct test. This *dispatch data* set is referred to as mitigated for conduct PD *dispatch data*.

The conduct test determines if any of the *dispatch data* parameters submitted by a *market participant* for a resource deviates from its respective reference level by more than a specified conduct threshold. When the conduct test is failed, the *dispatch data* parameters that exceeded the conduct thresholds are substituted with their reference levels for the purpose of determining schedules, prices and make-whole payments.

### Input and Output Data Flows

**Table 6-8: Process PD2 Input and Output Data Flows**

Flow	Source	Target	Frequency
Validated PD Dispatch Data	PD Calculation Engine	Process PD2	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The validated PD <i>dispatch data</i> refers to the set of <i>dispatch data</i> consumed by the PD calculation engine, as described in PD1.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Thresholds, Cost-Based Reference Levels, Conditions, Global Market Power Reference Interties	MPM Information System	Process PD2	Cost-Based Reference Levels; daily frequency. Conduct Thresholds; only when updated. Conditions; only when updated

<p><b>Description:</b></p> <p>The conduct test requires conduct thresholds, cost-based reference levels for each resource, conditions for mitigation and designated constrained areas, and the list of Global Market Power Reference Interties. Details regarding conduct thresholds may be found in Section 3.6.</p> <p>This data flow includes the following:</p> <ul style="list-style-type: none"> <li>• Conduct Thresholds for Price Impact Testing for NCAs and DCAs (Table 3-5);</li> <li>• Conduct Thresholds for Price Impact Testing for BCAs (Table 3-7);</li> <li>• Conduct Thresholds for Price Impact Testing for Global Market Power – Energy (Table 3-9);</li> <li>• Conduct Thresholds for Price Impact Testing for Local Market Power – Operating Reserve (Table 3-11);</li> <li>• Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve (Table 3-13);</li> <li>• Cost-Based Reference Levels: Details regarding cost-based reference levels may be found in Section 3.13.1.2;</li> <li>• The conditions for mitigation as found in Section 3.4;</li> <li>• The conduct test requires details of resources designated as either NCA or DCA and the designated NCA or DCA transmission constraints as found in Section 3.12; and</li> <li>• Global Market Power Reference Interties: At this time, the <i>IESO</i> considers the New York-Ontario <i>intertie</i> and the Michigan-Ontario <i>intertie</i> to be the Global Market Power Reference Interties.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct PD Dispatch Data	Process PD2	Process PD3	Once per PD calculation engine run.
<p><b>Description:</b></p> <p>Mitigated for conduct PD <i>dispatch data</i> utilized by the PD calculation engine includes:</p> <ul style="list-style-type: none"> <li>• Financial <i>dispatch data</i> parameters that failed the conduct test and were mitigated to their reference values; and</li> <li>• Financial <i>dispatch data</i> parameters that passed the conduct test and the as-submitted values were used.</li> </ul>			
Flow	Source	Target	Frequency
Enhanced Mitigated for Conduct PD Dispatch Data	Process PD2	Scheduling Processes Data Archive	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The enhanced mitigated for conduct <i>dispatch data</i> is the additional mitigated for conduct <i>energy</i> and <i>operating reserve dispatch data</i> that is not used by the PD calculation engine to establish schedules and LMPs, but is created by the engine for certain NQS resources using the most restrictive constraint conditions over the NQS commitment period, regardless of active binding transmission.</li> <li>• This enhanced mitigated for conduct <i>dispatch data</i> is saved in Scheduling Process Data Archive for future use in the settlement mitigation of make-whole payments process.</li> </ul>			
Flow	Source	Target	Frequency
PD Mitigation Inputs	Process PD1	Process PD2	Once per PD calculation engine run.

**Description:**

- PD mitigation inputs include the most restrictive competition category that occurred in each hour. For example, the NCA and DCA binding constraints that occurred in each hour are provided to the conduct test.

### 6.4.3 Process PD3: Generate Mitigated for Conduct PD Schedules and LMPs

#### Description

Process PD3 generates schedules and LMPs based on *energy* and *operating reserve dispatch data* consumed by the PD calculation engine and was subject to the conduct test (i.e. outputs mitigated for conduct *dispatch data*). The LMPs and schedules produced by this process are referred to as mitigated for conduct PD schedules and LMPs.

#### Input and Output Data Flows

**Table 6-9: Process PD3 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Conduct PD Dispatch Data	Process PD2	Process PD3	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Mitigated for conduct PD <i>dispatch data</i>, as described in process PD2, is used in the calculation of mitigated for conduct PD <i>energy</i> and <i>operating reserve</i> LMPs.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct PD LMPs, Mitigated for Conduct PD Dispatch Data	Process PD3	Process PD4	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The mitigated for conduct PD LMPs for <i>energy</i> and <i>operating reserve</i> are generated by the PD calculation engine based on <i>dispatch data</i> consumed by the engine and was subject to the conduct test. This data is the output of the second run of the PD calculation engine (Process PD3).</li> <li>• Mitigated for conduct PD <i>dispatch data</i> is described in Process PD2. Process PD3 passes the mitigated for conduct PD <i>dispatch data</i> to the price impact test (Process PD4).</li> </ul>			

## 6.4.4 Process PD4: Perform Price Impact Test for PD Energy and OR

### Description

Process PD4 carries out the price impact test for *energy* and *operating reserve*. The price impact test compares the as-offered PD LMPs to the mitigated for conduct PD LMPs and applies the price impact thresholds. Process PD4 outputs *dispatch data* that was subject to the price impact test (i.e. outputs mitigated for price impact *dispatch data*). This is described in Section 3.6.

### Input and Output Data Flows

**Table 6-10: Process PD4 Input and Output Data Flows**

Flow	Source	Target	Frequency
As-Offered PD LMPs, Validated PD Dispatch Data	Process PD1	Process PD4	Once per PD calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The as-offered PD LMPs are an input to the price impact test and is described in process PD1. The validated PD <i>dispatch data</i>, as defined in process DP1, is required to derive mitigated for price impact PD <i>dispatch data</i>.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct PD LMPs, Mitigated for Conduct PD Dispatch Data	Process PD3	Process PD4	Once per PD calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The mitigated for conduct PD LMPs for <i>energy</i> and <i>operating reserve</i> are an input into the price impact test.</li> <li>The mitigated for conduct PD <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>, as described in process PD2, is required to produce mitigated for price impact PD <i>dispatch data</i> in this process.</li> </ul>			
Flow	Source	Target	Frequency
Price Impact Thresholds	MPM Information System	Process PD4	Event-based. Whenever a threshold value is changed.

<p><b>Description:</b></p> <p>Details regarding price impact thresholds may be found in Section 3.6, and are indicated below:</p> <ul style="list-style-type: none"> <li>• Price Impact Thresholds for NCAs and DCAs (Table 3-6);</li> <li>• Price Impact Threshold for BCAs (Table 3-8);</li> <li>• Price Impact Threshold for Global Market Power – Energy (Table 3-10);</li> <li>• Price Impact Threshold for Local Market Power – Operating Reserve (Table 3-12); and</li> <li>• Price Impact Threshold for Global Market Power – Operating Reserve (Table 3-14).</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Price Impact PD Dispatch Data	Process PD4	Process PD5	Once per calculation engine run.
<p><b>Description:</b></p> <p>The outcome of the price impact test determines if mitigated for PD conduct <i>dispatch data</i> or unmitigated <i>dispatch data</i> (i.e. validated PD <i>dispatch data</i>) for <i>energy</i> and <i>operating reserve</i> is provided to Process PD5 to determine final PD LMPs and schedules.</p> <p>Mitigated for price impact PD <i>dispatch data</i> includes <i>energy</i> and <i>operating reserve</i>:</p> <ul style="list-style-type: none"> <li>• Financial <i>dispatch data</i> values that failed the price impact test and were mitigated to their reference levels;</li> <li>• Financial <i>dispatch data</i> values that passed the price impact test and were not altered (i.e., as-submitted); and</li> <li>• Validated non-financial <i>dispatch data</i>.</li> </ul> <p>The mitigated for price impact PD <i>dispatch data</i> is provided to Process PD5.</p>			

### 6.4.5 Process PD5: Generate Mitigated for Price Impact PD Schedules and LMPs

#### Description

Process PD5 generates optimized *energy* and *operating reserve* PD LMPs and schedules based on the *dispatch data* that was subject to the price impact test in the PD calculation engine. The outputs of this process are communicated to *market participants*.

#### Input and Output Data Flows

**Table 6-11: Process PD5 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Price Impact PD Dispatch Data	Process PD4	Process PD5	Once per PD calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Mitigated for price impact PD <i>dispatch data</i>, as defined in PD4, is used to generate PD <i>energy</i> and <i>operating reserve</i> LMPs and schedules.</li> </ul>			

Flow	Source	Target	Frequency
DAM Schedules and LMPs, DAM Mitigation Details, Binding Constraints, Constraint Values	Process PD5	Scheduling Processes Data Archive	Once per PD calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>Outputs of the PD calculation engine are saved for future use.</li> </ul>			
Flow	Source	Target	Frequency
PD Schedules and LMPs, PD Mitigation Details	Process PD5	Reporting Portal	Once per PD calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>Details regarding PD schedules, LMPs and mitigation activities are made available to the <i>market participant</i> submitting the <i>dispatch data</i>.</li> </ul>			

### 6.4.6 Process RT1: Generate Unmitigated RT Schedules and LMPs

#### Description

Process RT1 generates optimized *energy* and *operating reserve* RT schedules and locational marginal prices (LMPs). The schedules and LMPs produced by Process RT1 are based on validated, but unmitigated real time *energy* and *operating reserve dispatch data*. The LMPs produced by this process are referred to as the as-offered RT LMPs. The outputs of Process RT1 enable the RT conduct and price impact test. The outputs of this process are not communicated to *market participants*.

#### Input and Output Data Flows

Table 6-12: Process RT1 Input and Output Data Flows

Flow	Source	Target	Frequency
Validated RT Dispatch Data	RT Calculation Engine	Process RT1	Once per RT calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The validated RT <i>dispatch data</i> refers to the set of <i>dispatch data</i> consumed by the RT calculation engine, which includes both hourly and daily <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>.</li> <li>Validated RT <i>dispatch data</i> must have successfully passed the validation of non-financial <i>dispatch data</i> and financial <i>dispatch data</i>, not subjected to the market power mitigation conduct and price impact tests.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			

Flow	Source	Target	Frequency
As-Offered RT LMPs, Validated RT Dispatch Data	Process RT1	Process RT4	Once per RT calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The as-offered RT LMPs and schedules for <i>energy</i> and <i>operating reserve</i> are generated based on validated, but unmitigated RT <i>dispatch data</i>. These are outputs of the initial run of the RT calculation engine. The as-offered LMPs for <i>energy</i> and <i>operating reserve</i> are used in the price impact test which is described in Process RT5.</li> <li>Process RT1 passes the validated DAM <i>dispatch data</i> to the impact test (Process RT4).</li> </ul>			
Flow	Source	Target	Frequency
RT Mitigation Inputs	Process RT1	Process RT2	Once per RT calculation engine run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Mitigation details include the most restrictive competition category which occurred in each hour. For example, the NCA and DCA binding constraints which occurred in each hour are provided to the conduct test (Process RT2).</li> </ul>			

### 6.4.7 Process RT2: Perform Conduct Test for RT Energy and OR

#### Description

Process RT2 carries out the conduct test and outputs the mitigated *dispatch data* that was subject to the conduct test. This *dispatch data* set is referred to as mitigated for conduct RT *dispatch data*.

The conduct test determines if any of the *dispatch data* parameters submitted by a *market participant* for a resource deviates from its respective reference level by more than a specified conduct threshold. When the conduct test is failed, the *dispatch data* parameters that exceeded the conduct thresholds are substituted with their reference levels for the purpose of determining schedules, prices and make-whole payments.

#### Input and Output Data Flows

Table 6-13: Process RT2 Input and Output Data Flows

Flow	Source	Target	Frequency
Validated RT Dispatch Data	RT Calculation Engine	Process RT2	Once per RT calculation engine run.



<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The validated RT <i>dispatch data</i> refers to the set of <i>dispatch data</i> consumed by the RT calculation engine, which includes both hourly and daily <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>.</li> <li>Validated RT <i>dispatch data</i> must have successfully passed the validation of non-financial <i>dispatch data</i> and financial <i>dispatch data</i> not subjected to the market power mitigation conduct and price impact tests.</li> <li>Reference Process P1: Validation of Non-Financial Dispatch Data.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Thresholds, Cost Based Reference Levels, Conditions, Global Market Power Reference Interties	MPM Information System	Process RT2	Cost Based Reference Levels; daily frequency.  Conduct Thresholds; only when updated.  Conditions; only when updated
<p><b>Description:</b></p> <p>The conduct test requires conduct thresholds, cost-based reference levels for each resource, conditions for mitigation and designated constrained areas, and the list of Global Market Power Reference Interties. Details regarding conduct thresholds may be found in Section 3.6..</p> <p>This data flow includes the following:</p> <ul style="list-style-type: none"> <li>Conduct Thresholds for Price Impact Testing for NCAs and DCAs (Table 3-5);</li> <li>Conduct Thresholds for Price Impact Testing for the BCA (Table 3-7);</li> <li>Conduct Thresholds for Price Impact Testing for Global Market Power – Energy (Table 3-9);</li> <li>Conduct Thresholds for Price Impact Testing for Local Market Power – Operating Reserve (Table 3-11);</li> <li>Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve (Table 3-13);</li> <li>Cost-Based Reference Levels: Details regarding cost-based reference levels may be found in Section 3.13.1.2;</li> <li>The conditions for mitigation as found in Section 3.4;</li> <li>The conduct test requires details of resources designated as either NCA or DCA and the designated NCA or DCA transmission constraints as found in Section 3.12; and</li> <li>Global Market Power Reference Interties: At this time, the <i>IESO</i> considers the New York-Ontario <i>intertie</i> and the Michigan-Ontario <i>intertie</i> to be the Global Market Power Reference Interties.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct RT Dispatch Data	Process RT2	Process RT3	Once per RT calculation engine run.
<p><b>Description:</b></p> <p>Mitigated for conduct RT <i>dispatch data</i> is <i>dispatch data</i> that will be utilized by the RT calculation engine, and which includes:</p> <ul style="list-style-type: none"> <li>Financial <i>dispatch data</i> parameters that failed the conduct test and were mitigated to their reference values; and</li> <li>Financial <i>dispatch data</i> that passed the conduct test and the as-submitted values are retained in the data set.</li> </ul>			
Flow	Source	Target	Frequency

Enhanced Mitigated for Conduct RT Dispatch Data	Process RT2	Scheduling Processes Data Archive	Once per RT calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>The enhanced mitigated for conduct <i>dispatch data</i> is the additional mitigated for conduct <i>energy</i> and <i>operating reserve dispatch data</i> that is not used by the RT calculation engine to establish schedules and LMPs, but is created by the engine for certain NQS resources using the most restrictive constraint conditions over the NQS commitment period, regardless of active binding transmission.</li> <li>This enhanced mitigated for conduct <i>dispatch data</i> is saved in Scheduling Process Data Archive for future use in the settlement mitigation of make-whole payments process.</li> </ul>			
Flow	Source	Target	Frequency
RT Mitigation Inputs	Process RT1	Process RT2	Once per RT calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>RT mitigation inputs include the most restrictive competition category that occurred in each hour. For example, the NCA and DCA binding constraints that occurred in each hour are provided to the conduct test.</li> </ul>			

### 6.4.8 Process RT3: Generate Mitigated for Conduct RT Schedules and LMPs

#### Description

Process RT3 generates schedules and LMPs based on *energy* and *operating reserve dispatch data* consumed by the RT calculation engine and was subject to the conduct test (i.e. outputs mitigated for conduct *dispatch data*). The LMPs and schedules produced by this process are referred to as mitigated for conduct RT schedules and LMPs.

#### Input and Output Data Flows

Table 6-14: Process RT3 Input and Output Data Flows

Flow	Source	Target	Frequency
Mitigated for Conduct RT Dispatch Data	Process RT2	Process RT3	Once per RT calculation engine run.
<b>Description:</b> <ul style="list-style-type: none"> <li>Mitigated for conduct RT <i>dispatch data</i> is used in the calculation of mitigated for conduct RT <i>energy</i> and <i>operating reserve</i> LMPs. It is as described in process RT2.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct RT LMPs, Mitigated for Conduct RT Dispatch Data	Process RT3	Process RT4	Once per RT calculation engine run.

**Description:**

- The mitigated for conduct RT LMPs for *energy* and *operating reserve* are generated by the RT calculation engine based on *dispatch data* consumed by the engine and was subject to the conduct test. This data is the output of the second run of the RT calculation engine (Process RT3).
- Mitigated for conduct RT *dispatch data* is described in Process RT2. Process RT3 passes the mitigated for conduct PD *dispatch data* to the price impact test (Process RT4).

### 6.4.9 Process RT4: Perform Price Impact Test for RT Energy and OR

#### Description

Process RT4 carries out the price impact test for *energy* and *operating reserve*. The price impact test compares the as-offered RT LMPs to the mitigated for conduct RT LMPs and applies the price impact thresholds. Process RT4 outputs *dispatch data* that was subject to the price impact test (i.e. outputs mitigated for price impact *dispatch data*). This is described in Section 3.6.

#### Input and Output Data Flows

**Table 6-15: Process RT4 Input and Output Data Flows**

Flow	Source	Target	Frequency
As-Offered RT LMPs Validated RT Dispatch Data	Process RT1	Process RT4	Once per RT calculation engine run.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• The as-offered RT LMPs are an input to the price impact test and is described in process RT1.</li> <li>• The validated RT <i>dispatch data</i>, as defined in process RT1, is required to derive mitigated for price impact RT <i>dispatch data</i>.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct RT LMPs, Mitigated for Conduct RT Dispatch Data	Process RT3	Process RT4	Once per RT calculation engine run.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• The mitigated for conduct RT LMPs for <i>energy</i> and <i>operating reserve</i> are an input into the price impact test.</li> <li>• The mitigated for conduct RT <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>, as described in process RT2, is required to produce mitigated for price impact RT <i>dispatch data</i> in this process.</li> </ul>			
Flow	Source	Target	Frequency

Price Impact Thresholds	MPM Information System	Process RT4	Event-based Whenever a threshold value is changed
<p><b>Description:</b></p> <p>Details regarding price impact thresholds may be found in Section 3.6, and are indicated below:</p> <ul style="list-style-type: none"> <li>• Price Impact Thresholds for NCAs and DCAs (Table 3-6);</li> <li>• Price Impact Threshold for BCAs (Table 3-8);</li> <li>• Price Impact Threshold for Global Market Power – Energy (Table 3-10);</li> <li>• Price Impact Threshold for Local Market Power – Operating Reserve (Table 3-12); and</li> <li>• Price Impact Threshold for Global Market Power – Operating Reserve (Table 3-14).</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Price Impact RT Dispatch Data	Process RT4	Process RT5	Once per RT calculation engine run
<p><b>Description:</b></p> <p>The outcome of the price impact test determines if mitigated for RT conduct <i>dispatch data</i> or unmitigated <i>dispatch data</i> (i.e. validated RT <i>dispatch data</i>) for <i>energy</i> and <i>operating reserve</i> is provided to Process RT5 to determine final RT LMPs and schedules. Mitigated for price impact RT <i>dispatch data</i> includes <i>energy</i> and <i>operating reserve</i>:</p> <ul style="list-style-type: none"> <li>• Financial <i>dispatch data</i> values that failed the price impact test and were mitigated to their reference levels;</li> <li>• Financial <i>dispatch data</i> values that passed the price impact test and were not altered (i.e., as-submitted); and</li> <li>• Validated non-financial <i>dispatch data</i>.</li> </ul> <p>The mitigated for price impact RT <i>dispatch data</i> is provided to Process RT5.</p>			

### 6.4.10 Process RT5: Generate Mitigated for Price Impact RT Schedules and LMPs

#### Description

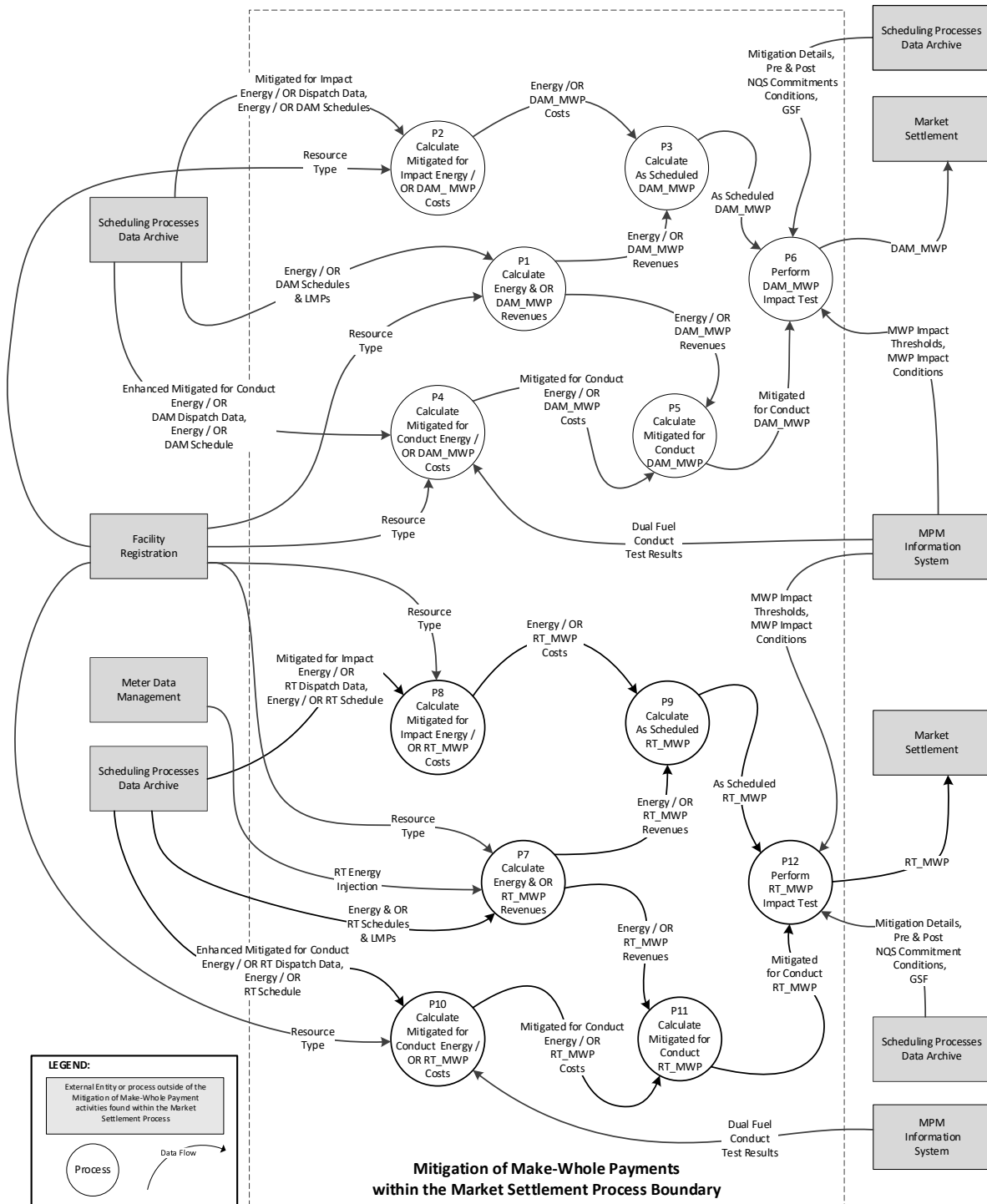
Process RT5 generates optimized *energy* and *operating reserve* RT LMPs and schedules based on the *dispatch data* that was subject to the price impact test in the RT calculation engine. The outputs of this process are communicated to *market participants*.

## Input and Output Data Flows

**Table 6-16: Process RT5 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Price Impact RT Dispatch Data	Process RT4	Process RT5	Once per RT calculation engine run
<b>Description:</b> <ul style="list-style-type: none"> <li>Mitigated for price impact RT <i>dispatch data</i>, as defined in RT4, is used to generate RT <i>energy</i> and <i>operating reserve</i> LMPs and schedules.</li> </ul>			
Flow	Source	Target	Frequency
RT Schedules & LMPs, RT Mitigation Details, Binding Constraints, Constraint Values	Process RT5	Scheduling Processes Data Archive	Once per RT calculation engine run
<b>Description:</b> <ul style="list-style-type: none"> <li>The outputs of the RT calculation engine are saved in Scheduling Processes Data Archive for future use.</li> </ul>			
Flow	Source	Target	Frequency
RT Schedules and LMPs, RT Mitigation Details	Process RT5	Reporting Portal	Once per RT calculation engine run
<b>Description:</b> <ul style="list-style-type: none"> <li>Details regarding RT schedules, LMPs and mitigation activities are made available to the <i>market participant</i> submitting the <i>dispatch data</i>.</li> </ul>			

## 6.5 Settlement Mitigation of Make Whole Payments



**Figure 6-4: Mitigation of Make-Whole Payments within Market Settlement Process Data Flow Diagram**

The DAM make-whole payment (DAM\_MWP) provides a *settlement amount* for dispatchable *generation facilities*, *dispatchable loads*, price responsive loads, and *boundary entities* that are scheduled in the day-ahead market when the *market participant* would otherwise incur an implied loss.

An implied loss is incurred when the *energy* and *operating reserve* revenue earned is insufficient to cover as-offered costs or as-*bid* benefits. An implied loss can occur even when a *facility* is economically scheduled. the DAM\_MWP will incorporate any required adjustment and mitigation tests into the calculation set out by the mitigation process.

The DAM calculation engine will maximize the gains from trade over an entire 24-hour period given *market participant* submitted *dispatch data*, resource constraints and the *reliability* needs of the system. At times, the most efficient and reliable schedule for the system as a whole can result in some *facilities* being scheduled at an implied loss. A *facility* could be scheduled at a loss to meet all system constraints for *reliability*, for example, to avoid violation of a transmission limit.

### **Overview of the DAM Make-Whole Payment Mitigation Processes**

The mitigation of a DAM\_MWP is based on a comparison of the as-scheduled DAM\_MWP (Process P3) to the Mitigated for Conduct DAM\_MWP (Process P5). The calculation of the as-scheduled DAM\_MWP requires the calculation of DAM revenues (Process P1) and DAM implied costs (Process P2).

Process P1 determines *energy* and *operating reserve* revenues based on *energy* and *operating reserve* DAM schedules and locational marginal prices (LMPs). The revenue associated with a DAM\_MWP is common to both the as-scheduled DAM\_MWP (Process P3) and the mitigated for conduct DAM\_MWP (Process P5).

Process P2 determines a resource's implied cost of production in DAM based on *energy* and *operating reserve dispatch data* mitigated for price impact resulting from ex-ante mitigation for economic withholding.

Process P3 calculates the as-scheduled *energy* and *operating reserve* DAM\_MWP based on the results of Process P1 and Process P2, subject to conditions as detailed in the Market Settlement detailed design.

Process P4 determines the resource's implied costs of production in DAM based on *energy* and *operating reserve* mitigated for conduct *dispatch data* using the most restrictive conduct threshold applicable over the settlement period (i.e., hourly or commitment).

Process P5 calculates the resource's *energy* and *operating reserve* DAM\_MWP based on the results of Process P1 and P4, subject to conditions as detailed in the Market Settlement detailed design document.

Process P6 applies the DAM\_MWP Impact Test by comparing MWPs from Process P3 and Process P5 using DAM\_MWP impact threshold.

### **Overview of the Real Time Make-Whole Payment Mitigation Processes**

The mitigation of Real Time Make-Whole Payments (RT\_MWP) in Processes P7 to P12 follow the same approach as described above in Processes P1 to P6, except that *real-time dispatch data*, *real-time* revenues and *real-time* injection amounts are used in calculating RT\_MWP.

## 6.5.1 Process P1: Calculate Energy and OR DAM\_MWP Revenues

### Description

Process P1 determines revenues based on *energy* and *operating reserve* DAM schedules and locational marginal prices (LMPs). The revenues associated with a DAM make-whole payment (MWP) are common to both the mitigated for impact DAM\_MWP (Process P2) and the mitigated for conduct DAM\_MWP (Process P5). The revenues associated with a make-whole payment are subject to conditions as described in the Market Settlement detailed design.

### Input and Output Data Flows

**Table 6-17: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Energy/OR DAM Schedules & LMPs	Scheduling Processes Data Archive	Process P1	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>DAM <i>energy</i> and <i>operating reserve</i> scheduled quantities and the DAM locational marginal prices (LMPs).</li> <li>These inputs are used to determine the revenues associated with a DAM_MWP and are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P1	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR DAM_MWP Revenues	Process P1	Process P3, Process P5	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The revenue associated with a DAM_MWP is common to both as-scheduled DAM_MWP (Process P3) and mitigated for conduct DAM_MWP (Process P5).</li> <li>The revenues associated with <i>energy</i> and <i>operating reserve</i> DAM_MWP are subject to conditions as described in the Market Settlement detailed design document.</li> <li>The revenues may be calculated by hour or by commitment period for certain NQS resources.</li> </ul>			



## 6.5.2 Process P2: Calculate Mitigated for Impact Energy/OR DAM\_MWP Costs

### Description

The costs of production are implied by mitigated for price impact *dispatch data* for *energy* and *operating reserve*, resulting from ex-ante mitigation of economic withholding process by the DAM calculation engine. Process P2 supports the calculation of the as-scheduled DAM\_MWP.

### Input and Output Data Flows

Table 6-18: Process P2 Input and Output Data Flows

Flow	Source	Target	Frequency
Mitigated for Impact Energy/OR DAM Dispatch Data Energy/OR DAM Schedules	Scheduling Processes Data Archive	Process P2	Daily
<p><b>Description:</b></p> <p>The DAM ex-ante mitigation for economic withholding process provides the following data for each resource scheduled in the day-ahead market:</p> <ul style="list-style-type: none"> <li>DAM mitigated for price impact <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>, and</li> <li>DAM <i>energy</i> and <i>operating reserve</i> schedules.</li> </ul> <p>This data is provided to Process P2 for the <i>settlement</i> calculation of implied costs.</p>			
Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P2	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR DAM_MWP Costs	Process P2	Process P3	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The DAM_MWP implied costs for <i>energy</i> and <i>operating reserve</i> are provided to Process P3 for the calculation of the as-scheduled DAM_MWP. Calculations of these costs are described in the Market Settlement detailed design document.</li> </ul>			

### 6.5.3 Process P3: Calculate As-Scheduled DAM\_MWP

#### Description

Process P3 calculates the as-scheduled DAM\_MWP based on *dispatch data* that was subject to the ex-ante economic withholding conduct and impact tests.

#### Input and Output Data Flows

Table 6-19: Process P3 Input and Output Data Flows

Flow	Source	Target	Frequency
Energy/OR DAM_MWP Costs	Process P2	Process P3	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The implied costs for <i>energy</i> and <i>operating reserve</i> DAM_MWP are required for the calculation of the as-scheduled DAM_MWP.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR DAM_MWP Revenues	Process P1	Process P3	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>DAM_MWP revenues for <i>energy</i> and <i>operating reserve</i> are required for the calculation of the as-scheduled DAM_MWP.</li> </ul>			
Flow	Source	Target	Frequency
As-Scheduled DAM_MWP	Process P3	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The as-scheduled DAM_MWP for <i>energy</i> and <i>operating reserve</i> are calculated in process P3, subject to conditions described in the Market Settlement detailed design document.</li> </ul>			

### 6.5.4 Process P4: Calculate Mitigated for Conduct Energy/OR DAM\_MWP Costs

#### Description

Process P4 determines the resources implied cost for *energy* and *operating reserve* based on mitigated for conduct *dispatch data* using the most restrictive conduct threshold applicable over the settlement period. The mitigated for conduct *dispatch data* using the most restrictive conduct threshold will be generated by the DAM calculation engine and saved into the Scheduling Processes Data Archive.

## Input and Output Data Flows

**Table 6-20: Process P4 Input and Output Data Flows**

Flow	Source	Target	Frequency
Energy/OR DAM Schedule, Enhanced Mitigated for Conduct Energy/OR DAM Dispatch Data	Scheduling Processes Data Archive	Process P4	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>DAM <i>energy</i> and <i>operating reserve</i> schedules are generated by the DAM calculation engine, and are made available to the <i>settlement process</i> for the calculation of costs.</li> <li>The mitigation of <i>energy</i> and <i>operating reserve dispatch data</i> occurs within the DAM calculation engine. DAM calculation engine generates mitigated for conduct <i>dispatch data</i> using the most restrictive competition category for the ex-ante mitigation of economic withholding conduct test.</li> <li>In addition to this set of mitigated for conduct <i>dispatch data</i>, the DAM calculation engine will produce mitigated for conduct <i>dispatch data</i> for all restrictive competition categories. Hence, this input data set is referred to as “enhanced mitigated for conduct <i>dispatch data</i>”.</li> </ul>			
Flow	Source	Target	Frequency
Dual Fuel Conduct Test Results	MPM Information System	Process P4	The use of the higher cost fuel type must be approved during the pre-market period.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will use the least expensive fuel type among the registered primary and secondary fuel types for a resource’s reference level for the timeframe when it tests a submitted <i>offer</i> for market power.</li> <li><i>Market participants</i> can request the <i>IESO</i> to change this default fuel type selection if the least expensive fuel (in \$/MWh), as flagged by the <i>market participant</i> and approved by the <i>IESO</i>, is unavailable or not preferred because of an acceptable reason for the specific subset of hours during the trading day.</li> <li>For additional details regarding this data flow, refer to the data flow diagram Settlement Mitigation of Request to Use Higher-Cost Fuel.</li> </ul>			
Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P4	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct Energy & OR DAM_MWP Costs	Process P4	Process P5	<i>Business days</i> to support internal generation of <i>settlement statements</i>

**Description:**

- The DAM\_MWP costs are based on mitigated for conduct *dispatch data* submitted to the DAM, and are calculated for both *energy* and *operating reserve* markets. The costs associated with a DAM\_MWP are subject to conditions as described in the Market Settlement detailed design document.

### 6.5.5 Process P5: Calculate Mitigated for Conduct DAM\_MWP

#### Description

Process P5 calculates *energy* and *operating reserve* make-whole payments based on DAM *dispatch data* mitigated for conduct using the most restrictive threshold.

#### Input and Output Data Flows

**Table 6-21: Process P5 Input and Output Data Flows**

Flow	Source	Target	Frequency
Mitigated for Conduct Energy/OR DAM_MWP Costs	Process P4	Process P5	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The implied DAM <i>energy</i> and <i>operating reserve</i> costs using the most restrictive conduct thresholds are provided to Process P5 for the calculation of the mitigated for conduct DAM_MWP.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR DAM_MWP Revenues	Process P1	Process P5	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The DAM_MWP revenues for <i>energy</i> and <i>operating reserve</i> are calculated for each hour for quick start resources and for each commitment period for eligible NQS resources.</li> <li>Make-whole payment revenues are subject to conditions that are described in the Market Settlement detailed design document.</li> <li><i>Energy</i> and <i>operating reserve</i> DAM_MWP revenues are provided to Process P5, which are compared with implied costs for the calculation of the mitigated for conduct DAM_MWP.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct DAM_MWP	Process P5	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>Mitigated for Conduct DAM_MWP is subject to the conditions which are described in the Market Settlement detailed design. These mitigated for conduct <i>energy</i> and <i>operating reserve</i> DAM_MWPs are provided to the DAM_MWP impact test (Process P6).</li> </ul>			

## 6.5.6 Process P6: Perform DAM\_MWP Impact Test

### Description

Process P6 performs the day-ahead market make-whole payment (DAM\_MWP) impact test for *energy* and *operating reserve*.

The DAM\_MWP impact test compares:

1. the DAM\_MWP based on *dispatch data* used by the DAM calculation engine to set schedules and prices (i.e., as-scheduled DAM\_MWP); and
2. the DAM\_MWP based on *dispatch data* using the most restrictive conduct threshold (i.e., mitigated for conduct DAM\_MWP).

If the first DAM\_MWP is greater than the second DAM\_MWP by more than the make-whole payment impact threshold, then the resource fails the DAM\_MWP impact test. If the resource fails the DAM\_MWP impact test, the *market participant* will be paid the DAM\_MWP based on *dispatch data* using the most restrictive conduct threshold (i.e., mitigated for conduct DAM\_MWP). Otherwise, they will receive the DAM\_MWP based on *dispatch data* as used by the DAM calculation engine (i.e., as-scheduled DAM\_MWP).

### Input and Output Data Flows

**Table 6-22: Process P6 Input and Output Data Flows**

Flow	Source	Target	Frequency
As-Scheduled DAM_MWP	Process P3	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• The as-scheduled DAM_MWP is calculated in Process P3, subject to conditions, which are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct DAM_MWP	Process P5	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• The mitigated for conduct DAM_MWP is calculated in Process P5, subject to conditions, which are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
MWP Impact Thresholds, MWP Impact Conditions	MPM Information System	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>

**Description:**

For MWP Impact Thresholds and MWP Impact Conditions, refer to Section 3.8 Settlement Mitigation for Make-Whole Payment Impact. These inputs are described below:

**Make-Whole Payment Impact Thresholds**

- Make-whole payment impact thresholds for NCAs and DCAs due to local market power in the DAM and RT *energy market*: (Table 3-16);
- Make-whole payment impact thresholds for BCAs due to local market power in the DAM and RT *energy market*: (Table 3-18);
- Make-whole payment impact thresholds for *reliability* constraints in the DAM and RT *energy market*: (Table 3-20);
- Make-whole payment impact thresholds due to global market power in the DAM and RT *energy market*: (Table 3-22);
- Make-whole payment impact thresholds due to local market power in the DAM and RT *operating reserve market*: (Table 3-24); and
- Make-whole payment impact thresholds due to global market power in the DAM and RT *operating reserve market*: (Table 3-26).

**Make-Whole Payment Impact Conditions**

- Conditions for mitigation of local market power for make-whole payment impact in NCAs and DCAs as listed in Section 3.8.1;
- Conditions for mitigation of local market power for make-whole payment impact in the BCA as listed in Section 3.8.2;
- Conditions for mitigation of local market power for make-whole payment impact due to *reliability* constraints as listed in Section 3.8.3;
- Conditions for mitigation of global market power for make-whole payment in the *energy market* as listed in Section 3.8.4;
- Conditions for mitigation of local market power for make-whole payment impact in the *operating reserve market* as listed in 3.8.5; and
- Conditions for mitigation for global market power for make-whole payment impact in the *operating reserve market* as listed in Section 3.8.6.

Flow	Source	Target	Frequency
Mitigation Details Pre & Post Commitment Details GSF	Scheduling Processes Data Archive	Process P6	<i>Business days</i> to support internal generation of <i>settlement statements</i>

<b>Description:</b>			
<ul style="list-style-type: none"> <li>Mitigation details includes data on the mitigation conditions prevalent for a given interval in the ex-ante DAM scheduling timeframe. P6 uses the mitigation conditions to determine the make-whole payment threshold value to apply in the make-whole payment impact test. Mitigation details includes data such as the most restrictive mitigation category (i.e., Global market power /NCA/DCA/BCA/Reliability) for the interval.</li> <li>Pre and post commitment details are used to determine if the constraint would have been binding or would have been violated but for the commitment of the resource.</li> <li>The Generation Shift Factor (GSF) is required to support the following condition: An NQS resource was committed, which would otherwise receive a make-whole payment, and has a GSF greater than 0.02 on an active constraint that is an NCA or DCA constraint.</li> </ul>			
Flow	Source	Target	Frequency
DAM_MWP	Process P6	Market Settlement	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The resulting DAM_MWP from the impact test is made available to <i>settlement process</i>, which produces preliminary <i>settlement statements</i> for the <i>market participants</i>.</li> </ul>			

### 6.5.7 Process P7: Calculate Energy and OR RT\_MWP Revenues

#### Description

Process P7 determines revenues based on *energy* and *operating reserve* real time (RT) schedules, real time *energy* injections and locational marginal prices (LMPs). The revenues associated with a RT make-whole payment (MWP) are common to both the mitigated for impact RT\_MWP (Process P8) and the mitigated for conduct RT\_MWP (Process P11). The revenues associated with a MWP are subject to conditions as described in the Market Settlement detailed design document.

#### Input and Output Data Flows

Table 6-23: Process P7 Input and Output Data Flows

Flow	Source	Target	Frequency
Energy/OR RT Schedules and LMPs	Scheduling Processes Data Archive	Process P7	Daily
<b>Description:</b>			
<ul style="list-style-type: none"> <li>Real time (RT) <i>energy</i> and <i>operating reserve</i> scheduled quantities and the RT locational marginal prices (LMPs) are used to determine the revenues associated with a RT_MWP, which are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
RT Energy Injection	Meter Data Management	Process P7	Daily
<b>Description:</b>			

<ul style="list-style-type: none"> <li>Real time (RT) <i>energy</i> injection data (i.e., Allocated Quantity of Energy Injected) is used to determine the RT_MWP revenues.</li> </ul>			
Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P7	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR RT_MWP Revenues	Process P7	Process P9, Process P11	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The revenue associated with a RT_MWP is common to both the as-scheduled RT_MWP (Process P9) and mitigated for conduct RT_MWP (Process P11).</li> <li>The revenues associated with <i>energy</i> and <i>operating reserve</i> RT_MWP are subject to conditions as described in the Market Settlement detailed design document.</li> <li>These revenues may be calculated by hour or by commitment period for certain NQS resources.</li> </ul>			

### 6.5.8 Process P8: Calculate Mitigated for Impact Energy/OR RT\_MWP Costs

#### Description

The costs of production are implied by mitigated for price impact *dispatch data* for *energy* and *operating reserve*, resulting from ex-ante mitigation of economic withholding process by the RT calculation engine. Process P8 supports the calculation of the as-scheduled RT\_MWP.

#### Input and Output Data Flows

Table 6-24: Process P8 Input and Output Data Flows

Flow	Source	Target	Frequency
Mitigated for Impact Energy/OR RT Dispatch Data, Energy/OR RT Schedules	Scheduling Processes Data Archive	Process P8	Daily
<b>Description:</b> <p>The real time (RT) ex-ante mitigation for economic withholding process provides the following data for each resource scheduled in the day-ahead market:</p> <ul style="list-style-type: none"> <li>Real time mitigated for price impact <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i>; and</li> <li>Real time <i>energy</i> and <i>operating reserve</i> schedules.</li> </ul> <p>This data is provided to Process P8 for the <i>settlement</i> calculation of implied costs.</p>			



Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P8	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR RT_MWP Costs	Process P8	Process P9	<i>Business days to support internal generation of settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The real time (RT) <i>energy</i> and <i>operating reserve</i> implied costs are provided to Process P9 for the calculation of the as-scheduled RT_MWP. These costs are calculated using mitigated for price impact <i>dispatch data</i> as described in Market Settlement detailed design document.</li> </ul>			

### 6.5.9 Process P9: Calculate As-Scheduled RT\_MWP

#### Description

Process P9 calculates the as-scheduled RT\_MWP based on *dispatch data* that was subject to the ex-ante economic withholding conduct and impact tests.

#### Input and Output Data Flows

Table 6-25: Process P9 Input and Output Data Flows

Flow	Source	Target	Frequency
Energy/OR RT_MWP Costs	Process P8	Process P9	<i>Business days to support internal generation of settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The implied costs for <i>energy</i> and <i>operating reserve</i> RT_MWP are required for the calculation of the as-scheduled RT_MWP.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR RT_MWP Revenues	Process P7	Process P9	<i>Business days to support internal generation of settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>RT_MWP revenues for <i>energy</i> and <i>operating reserve</i> are required for the calculation of the as-scheduled RT_MWP.</li> </ul>			
Flow	Source	Target	Frequency
As-Scheduled RT_MWP	Process P9	Process P12	<i>Business days to support internal generation of settlement statements</i>

**Description:**

- The as-scheduled DAM\_MWP for *energy* and *operating reserve* are calculated in process P9, subject to conditions described in the Market Settlement detailed design document.

### 6.5.10 Process P10: Calculate Mitigated for Conduct Energy/OR RT\_MWP Costs

#### Description

Process P10 determines the resources implied cost based on mitigated for conduct *dispatch data* using the most restrictive conduct threshold applicable over the *settlement* period. The mitigated for conduct *dispatch data* using the most restrictive conduct threshold data will be calculated by the RT calculation engine and saved into the Scheduling Processes Data Archive.

#### Input and Output Data Flows

**Table 6-26: Process P10 Input and Output Data Flows**

Flow	Source	Target	Frequency
Energy/OR RT Schedule, Enhanced Mitigated for Conduct Energy/OR RT Dispatch Data	Scheduling Processes Data Archive	Process P10	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>RT <i>energy</i> and <i>operating reserve</i> schedules are generated by the RT calculation engine, and are made available to the <i>settlement process</i> for the calculation of costs.</li> <li>The mitigation of <i>energy</i> and <i>operating reserve dispatch data</i> occurs within the RT calculation engine. The RT calculation engine generates mitigated for conduct <i>dispatch data</i> using the most restrictive competition category for the ex-ante mitigation of economic withholding conduct test.</li> <li>In addition to this set of mitigated for conduct <i>dispatch data</i>, the RT calculation engine will produce mitigated for conduct <i>dispatch data</i> for all restrictive competition categories. Hence, this input data set is referred to as “enhanced mitigated for conduct <i>dispatch data</i>”.</li> </ul>			
Flow	Source	Target	Frequency
Dual Fuel Conduct Test Results	MPM Information System	Process P10	The use of the higher cost fuel type must be approved during the pre-market period.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will use the least expensive fuel type among the registered primary and secondary fuel types for a resource’s reference level for the timeframe when it tests a submitted <i>offer</i> for market power. <i>Market participants</i> can request the <i>IESO</i> to change this default fuel type selection if the least expensive fuel (in \$/MWh), as flagged by the <i>market participant</i> and approved by the <i>IESO</i>, is unavailable or not preferred because of an acceptable reason for the specific subset of hours during the trading day.</li> <li>For additional details regarding this data flow, refer to the data flow diagram Settlement Mitigation of Request to Use Higher Cost Fuel (Section 6.12).</li> </ul>			

Flow	Source	Target	Frequency
Resource Type	Facility Registration	Process P10	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>The resource type is required in order to identify certain make-whole payments specific to NQS resources.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct Energy & OR RT_MWP Costs	Process P10	Process P11	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The RT_MWP costs are based on mitigated for conduct <i>dispatch data</i> submitted to the RT engine, and are calculated for both <i>energy</i> and <i>operating reserve</i> markets. The costs associated with a RT_MWP are subject to conditions as described in the Market Settlement detailed design document.</li> </ul>			

### 6.5.11 Process P11: Calculate Mitigated for Conduct RT\_MWP

#### Description

Process P11 calculates *energy* and *operating reserve* make-whole payment based on RT *dispatch data* mitigated for conduct using the most restrictive thresholds.

#### Input and Output Data Flows

Table 6-27: Process P11 Input and Output Data Flows

Flow	Source	Target	Frequency
Mitigated for Conduct Energy/OR RT_MWP Costs	Process P10	Process P11	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The implied RT <i>energy</i> and <i>operating reserve</i> costs using the most restrictive conduct thresholds are provided to Process P11 for the calculation of the mitigated for conduct RT_MWP.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR RT_MWP Revenues	Process P7	Process P11	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The RT_MWP revenues for <i>energy</i> and <i>operating reserve</i> are provided to Process P11 for the calculation of the mitigated for conduct RT_MWP.</li> </ul>			
Flow	Source	Target	Frequency

Mitigated for Conduct RT_MWP	Process P11	Process P12	<i>Business days to support internal generation of settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The mitigated for conduct RT_MWP is subject to the conditions, which are described in the Market Settlement detailed design document.</li> <li>These mitigated for conduct <i>energy</i> and <i>operating reserve</i> RT_MWPs are provided to the RT_MWP impact test (Process P12).</li> </ul>			

## 6.5.12 Process P12: Perform RT\_MWP Impact Test

### Description

Process P12 performs the *real-time* make-whole payment (RT\_MWP) impact test for *energy* and *operating reserve*.

The RT\_MWP impact test will compare:

- the RT\_MWP based on *dispatch data* as used by the RT calculation engine (i.e., As-Scheduled RT\_MWP); and
- the RT\_MWP based on *dispatch data* using the most restrictive conduct threshold (i.e., Mitigated for Conduct RT\_MWP).

If the first RT\_MWP is greater than the second RT\_MWP by more than a RT\_MWP impact threshold, then the resource has failed the RT\_MWP impact test. If the resource fails the RT\_MWP impact test, the *market participant* will be paid the RT\_MWP based on *dispatch data* using the most restrictive conduct threshold (i.e., mitigated for conduct RT\_MWP). Otherwise, they will receive the RT\_MWP based on *dispatch data* as scheduled by the RT calculation engine (i.e., as-scheduled RT\_MWP).

### Input and Output Data Flows

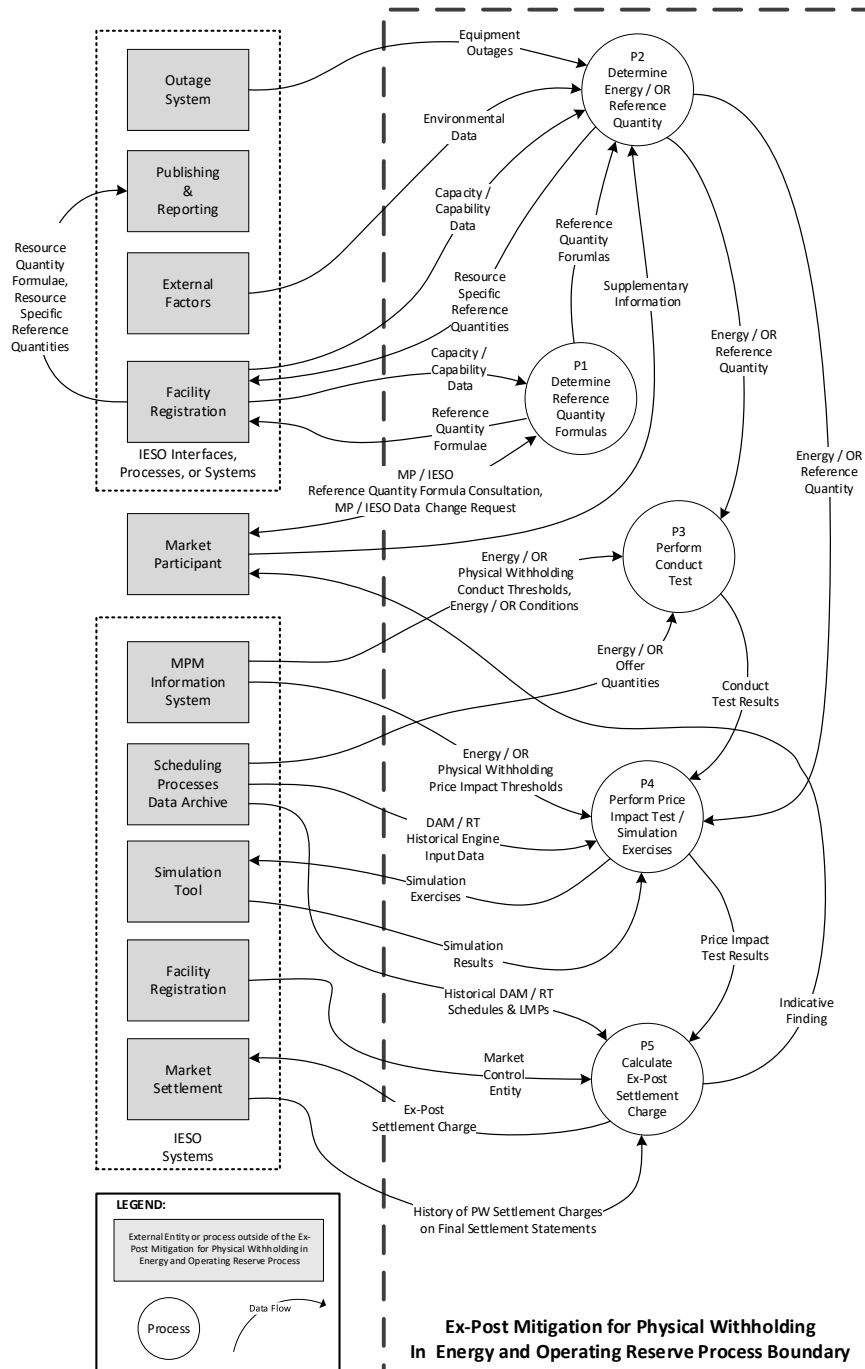
**Table 6-28: Process P12 Input and Output Data Flows**

Flow	Source	Target	Frequency
As-Scheduled RT_MWP	Process P9	Process P12	<i>Business days to support internal generation of settlement statements</i>
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The as-scheduled RT_MWP is calculated in Process P9, subject to conditions, which are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
Mitigated for Conduct RT_MWP	Process P11	Process P12	<i>Business days to support internal generation of settlement statements</i>

<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The mitigated for conduct RT_MWP is calculated in Process P11, subject to conditions, which are described in the Market Settlement detailed design document.</li> </ul>			
Flow	Source	Target	Frequency
MWP Impact Thresholds, MWP Impact Conditions	MPM Information System	Process P12	<i>Business days</i> to support internal generation of settlement statements
<p><b>Description:</b></p> <p>For MWP Impact Thresholds and MWP Impact Conditions, refer to Section 3.8 Settlement Mitigation for Make-Whole Payment Impact. These inputs are described below:</p> <p><b>MWP Impact Thresholds</b></p> <ul style="list-style-type: none"> <li>Make-whole payment impact thresholds for NCAs and DCAs due to local market power in the DAM and RT <i>energy market</i>: (Table 3-16);</li> <li>Make-whole payment impact thresholds for BCAs due to local market power in the DAM and RT <i>energy market</i>: (Table 3-18);</li> <li>Make-whole payment impact thresholds for <i>reliability</i> constraints in the DAM and RT <i>energy market</i>: (Table 3-20);</li> <li>Make-whole payment impact thresholds due to global market power in the DAM and RT <i>energy market</i>: (Table 3-22);</li> <li>Make-whole payment impact thresholds due to local market power in the DAM and RT <i>operating reserve market</i>: (Table 3-24); and</li> <li>Make-whole payment impact thresholds due to global market power in the DAM and RT <i>operating reserve market</i>: (Table 3-26).</li> </ul> <p><b>Make-Whole Payment Impact Conditions</b></p> <ul style="list-style-type: none"> <li>Conditions for Mitigation of Local Market Power for Make-Whole Payment Impact in NCAs and DCAs as listed in Section 3.8.1;</li> <li>Conditions for Mitigation of Local Market Power for Make-Whole Payment Impact in the BCA as listed in Section 3.8.2;</li> <li>Conditions for Mitigation of Local Market Power for Make-Whole Payment Impact due to <i>Reliability</i> Constraints as listed in Section 3.8.3;</li> <li>Conditions for Mitigation of Global Market Power for Make-Whole Payment in the Energy Market as listed in Section 3.8.4;</li> <li>Conditions for Mitigation of Local Market Power for Make-Whole Payment Impact in the Operating Reserve Market as listed in 3.8.5; and</li> <li>Conditions for Mitigation for Global Market Power for Make-Whole Payment Impact in the Operating Reserve Market as listed in Section 3.8.6.</li> </ul>			
Flow	Source	Target	Frequency

Mitigation Details, Pre & Post Commitment Details, GSF	Scheduling Processes Data Archive	Process P12	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Mitigation details includes data on the mitigation conditions prevalent for a given interval in the ex-ante RT scheduling timeframe. Process P12 uses the mitigation conditions to determine the MWP threshold value to apply in the MWP Impact test. Mitigation details includes data such as the most restrictive mitigation category (i.e., GMP/ /NCA/DCA/BCA/<i>Reliability</i>) for the interval.</li> <li>Pre and post commitment details are used to determine if the constraint would have been binding or would have been violated but for the commitment of the resource.</li> <li>The Generation Shift Factor (GSF) is required to support the following condition: <ul style="list-style-type: none"> <li>An NQS resource was committed, which would otherwise receive a make-whole payment, and has a GSF greater than 0.02 on any binding constraint that was not an NCA or DCA constraint.</li> </ul> </li> </ul>			
Flow	Source	Target	Frequency
RT_MWP	Process P12	Market Settlement	<i>Business days</i> to support internal generation of <i>settlement statements</i>
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The resulting RT_MWP from the impact test is made available to the <i>settlement process</i>, which produces the preliminary <i>settlement statements</i> for the <i>market participants</i>.</li> </ul>			

## 6.6 Ex-Post Mitigation for Physical Withholding in Energy and OR Process



**Figure 6-5: Ex-Post Mitigation for Physical Withholding in Energy and Operating Reserve Data Flow Diagram.**

### 6.6.1 Process P1: Determine Reference Quantity Formulas

#### Description

Process P1 describes how the *IESO* will determine the formulae for calculating reference quantities for *energy* and *operating reserve*.

#### Input and Output Data Flows

Table 6-29: Process P1 Input and Output Data Flows

Flow	Source	Target	Frequency
MP/IESO Reference Quantity Formula Consultation MP/IESO Data Change Request	Market Participant, IESO	Process P1, Market Participant	As needed
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The methodology that the <i>IESO</i> will follow to determine reference quantities is described in Section 3.13.1.</li> </ul>			
Flow	Source	Target	Frequency
Capacity/Capability Data	Facility Registration	Process P1	Event-based On update of facility registration data
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The formula for resource quantity is based on capacity and capability data such as DR Capability, Nameplate Capacity, Heat Rates and other factors as recorded by the Facility Registration process.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Reference Quantity Formulae	Process P1	Process P2, Facility Registration	As needed.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The reference quantity for suppliers of <i>energy</i> and <i>operating reserve</i> will be based on the operational capability of the resource. Operational restrictions that prevent a supplier of <i>operating reserve</i> from providing incremental <i>energy</i> can be reflected in their reference quantity.</li> <li>Reference quantity formulas for <i>energy</i> and <i>operating reserve</i> for a resource will be recorded in Facility Registration. The formulas are provided to process P2 to determine reference quantities for the <i>trading day</i>.</li> </ul>			



## 6.6.2 Process P2: Determine Energy and OR Reference Quantity

### Description

Process P2 collects the *energy* and *operating reserve* reference quantity formulas from process P1 and other inputs as described below to determine the *energy* and *operating reserve* reference quantity values for the *trading day*.

### Input and Output Data Flows

**Table 6-30: Process P2 Input and Output Data Flows**

Flow	Source	Target	Frequency
Capacity/Capability Data	Facility Registration	Process P2	Daily.
<b>Description:</b> <ul style="list-style-type: none"> <li>This input data set includes parameters stored in Facility Registration that are used in reference quantity formula.</li> <li>Resource and equipment capacity and capability data such as DR Capability, Nameplate Capacity, etc. are retrieved from Facility Registration in order to calculate reference quantities for the resource.</li> </ul>			
Flow	Source	Target	Frequency
Equipment Outages	Outage System	Process P2	Daily.
<b>Description:</b> <p>The available capacity of a generating resource is impacted by <i>outage</i> that were in effect during the study period. <i>Outage</i> data will include;</p> <ul style="list-style-type: none"> <li>All <i>planned outages</i> and equipment de-ratings during the study period; and</li> <li>All <i>forced outages</i> and equipment de-ratings during the study period.</li> </ul>			
Flow	Source	Target	Frequency
Environmental Data	External Factors	Process P2	Daily.
<b>Description:</b> <p>Environmental data may affect the performance capability of some resources. Environmental data may include the following measurements:</p> <ul style="list-style-type: none"> <li>ambient temperature;</li> <li>relative humidity;</li> <li>water flows and water levels; and</li> <li>other resource specific considerations.</li> </ul>			
Flow	Source	Target	Frequency
Supplementary Information	Market Participant	Process P2	On receipt of Indicative Finding.

<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Triggered by Process P4, the <i>market participant</i> may receive an indicative finding of potential physical withholding. The indicative finding includes information such as an estimate of the <i>settlement</i> charge and the preliminary reference quantities.</li> <li>The <i>market participant</i> has the opportunity to respond to the indicative finding by providing supplementary information to the <i>IESO</i>. Relevant supplementary information may include information regarding local factors such as ambient temperature, humidity, water flow conditions and other resource specific considerations that are not accounted for in the registered reference quantity formula.</li> <li>If the information provided by the <i>market participant</i> changes the reference quantity that the <i>IESO</i> had used in the initial conduct and impact tests, the <i>IESO</i> will re-run the conduct test (Process P3) and price impact test (Process P4). If the re-run still results in a failure of the conduct and price impact tests, that revised finding will be used to determine a <i>settlement</i> charge (Process P5).</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Reference Quantity	Process P2	Process P3, Process P4	Daily/per Conduct Test Impact Test; whenever a simulation exercise is required.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>energy</i> reference quantity and <i>operating reserve</i> reference quantity establish the resources generating capability for each interval of the study period. The reference quantities are provided to the ex-post physical withholding conduct and price impact tests.</li> </ul>			

### 6.6.3 Process P3: Perform Conduct Test

#### Description

Process P3 performs the the conduct test for physical withholding of *energy* to any resource that meets any of the conditions discussed in the table below.

The conduct test is applied to *energy* and *operating reserve* resources that meet the *energy* conditions and/or the *operating reserve* conditions for mitigation. The physical withholding conduct test determines if the *offer* quantity is less than the reference quantity minus the relevant conduct threshold. The conduct test is applied for each hour for each resource.

#### Input and Output Data Flows

Table 6-31: Process P3 Input and Output Data Flows

Flow	Source	Target	Frequency
Energy/OR Reference Quantity	Process P2	Process P3	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>energy</i> reference quantity and <i>operating reserve</i> reference quantity establish the resource’s generating capability in each hour of the study period.</li> </ul>			

Flow	Source	Target	Frequency
Energy/OR Offer Quantities	Scheduling Processes Data Archive	Process P3	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>energy offer</i> quantity and <i>operating reserve offer</i> quantity is the resource capacity that was offered into the <i>energy</i> and <i>operating reserve</i> market in each hour of the study period.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Test Results	Process P3	Process P4	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The physical withholding conduct test determines if the <i>offer</i> quantity is less than the reference quantity minus the conduct threshold. The conduct test is applied to <i>energy</i> and <i>operating reserve offers</i> submitted by the resource for each hour of the study period.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Physical Withholding Conduct Thresholds, Energy/OR Conditions	MPM Information System	Process P3	Updated due to a change in thresholds or conditions.
<p><b>Description:</b></p> <p>The physical withholding conduct thresholds are applied to the <i>energy</i> and <i>operating reserve dispatch data</i>; as provided in Section 3.9:</p> <ul style="list-style-type: none"> <li>Conduct Thresholds for Physical Withholding - Energy (Table 3-27: Conduct Thresholds for Physical Withholding); and</li> <li>Conduct Thresholds for Physical Withholding - Operating Reserve (Table 3-30: Conduct Thresholds for Physical Withholding).</li> </ul> <p>The conditions for mitigation are described in Section 3.9.</p>			

### 6.6.4 Process P4: Perform Price Impact Test/Simulation Exercises

#### Description

Process P4 describes how the *IESO* will perform ex-post analysis of market impact due to physical withholding of *energy* and *operating reserve* by running market simulations.

The *IESO* may perform the price impact test for physical withholding on resources that meet all the conditions described above and fail any of the conduct tests. Table 3-28 describes the physical withholding price impact thresholds that will be applied for *energy* and *operating reserve*.

## Input and Output Data Flows

**Table 6-32: Process P4 Input and Output Data Flows**

Flow	Source	Target	Frequency
DAM/RT Historical Engine Input Data	Scheduling Processes Data Archive	Process P4	Per simulation exercise
<p><b>Description:</b></p> <p>In order to simulate DAM/RT trading periods, the simulation exercise requires the historical DAM and RT calculation engine inputs over the study period. These inputs were previously captured during the ex-ante timeframe and were saved to the Scheduling Processes Data Archive. The historical data inputs include:</p> <ul style="list-style-type: none"> <li>Validated <i>dispatch data</i> submitted to the day-ahead market for the study period; and</li> <li>Validated <i>dispatch data</i> submitted to the real-time market for the study period.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Test Results	Process P3	Process P4	Per simulation exercise
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The physical withholding conduct test determines if the <i>offer</i> quantity is less than the reference quantity minus the relevant conduct threshold. The conduct test results include physical withholding of <i>energy</i> and <i>operating reserve offers</i> for each hour of the study period by resource.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Physical Withholding Price Impact Thresholds	MPM Information System	Process P4	Event-based. On change of price impact thresholds.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The physical withholding price impact thresholds for <i>energy</i> are provided in Table 3-28.</li> <li>The physical withholding impact thresholds for <i>operating reserve</i> are provided in Table 3-31.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Reference Quantity	Process P2	Process P4	Whenever a simulation exercise is required
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>energy</i> reference quantity and <i>operating reserve</i> reference quantity established in process P2 for the resource for each hour of the study period.</li> </ul>			
Flow	Source	Target	Frequency
Simulation Exercises	Process P4	Simulation Tool	Whenever a simulation exercise is required.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>A baseline simulation is performed by running the simulation DAM/RT calculation engines using the relevant set of historical engine input data. The baseline simulation results are compared with actual historical engine results to ensure accuracy of the input data.</li> </ul>			

<ul style="list-style-type: none"> <li>A reference quantity simulation is performed by running the simulation in DAM/RT calculation engines and using a modified set of engine input data. In the reference quantity simulation, the <i>energy</i> and <i>operating reserve offer</i> quantities that failed the conduct test are replaced with their <i>energy/operating reserve</i> reference quantity.</li> </ul>			
Flow	Source	Target	Frequency
Simulation Results	Simulation Tool	Process P4	As needed.
<b>Description:</b> <ul style="list-style-type: none"> <li>The simulation exercises provide an alternate valuation of locational marginal prices (LMPs), which are used to run the price impact test.</li> </ul>			
Flow	Source	Target	Frequency
Price Impact Test Results	Process P4	Process P5	Per simulation exercise
<b>Description:</b> <ul style="list-style-type: none"> <li>As described in Sections 3.9.2 and 3.9.3, the impact test assesses impact to <i>energy</i> and <i>operating reserve</i> LMPs of a resource in day-ahead and real-time. The price impact test does not assess impact to <i>energy</i> and <i>operating reserve</i> make-whole payments as the <i>IESO</i> does not pay make-whole payments to unoffered capacity.</li> <li>The price impact test compares baseline simulation LMPs with reference level simulation LMPs of the resource over the study period. If the difference between these two LMPs exceed the physical withholding impact threshold, then the resource is deemed to have failed the price impact test.</li> <li>When price impact test results indicate a failure, the resource is subject to a settlement charge (Process P5). No <i>settlement</i> charge is calculated if price impact test results are passed. In addition to pass/fail flag, the price impact test results will include resources that failed the price impact test in DAM and RT for <i>energy</i> and <i>operating reserve</i> over the study period.</li> </ul>			

### 6.6.5 Process P5: Calculate Ex-Post Settlement Charge

#### Description

Process P5 calculates the ex-post base settlement charge for *energy* and *operating reserve*, as described in Section 3.9, that will be applied to *market participants* for each instance of physical withholding, and adjusted by a persistence multiplier.

#### Input and Output Data Flows

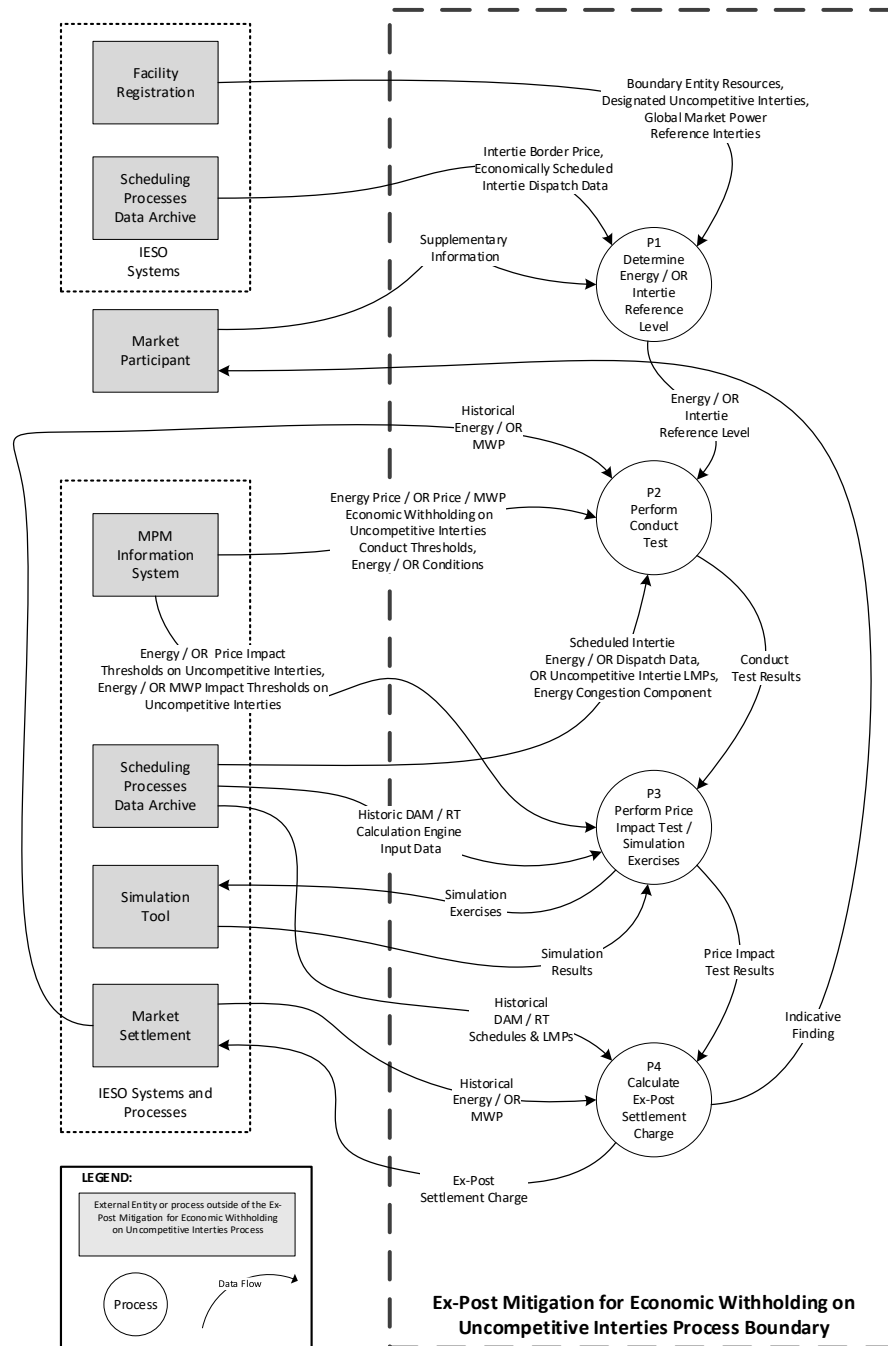
Table 6-33: Process P5 Input and Output Data Flows

Flow	Source	Target	Frequency
Historical DAM/RT Schedules & LMPs	Scheduling Processes Data Archive	Process P5	Per Indicative Finding/Determinative Finding
<b>Description:</b> <ul style="list-style-type: none"> <li>The historical <i>settlement</i> data consists of <i>energy</i> and <i>operating reserve</i> day-ahead <i>market schedules</i> and LMPs and <i>energy</i> and <i>operating reserve</i> real-time <i>schedules</i> and LMPs for each resource, which are required to calculate the <i>settlement</i> charge.</li> </ul>			
Flow	Source	Target	Frequency

Flow	Source	Target	Frequency
Indicative Finding	Process P5	Market Participant	Per Indicative Finding/Determinative Finding
<p><b>Description:</b></p> <p>The indicative findings include the preliminary (<i>energy and operating reserve</i>) reference quantities, and an estimate of the settlement charge. The estimated <i>settlement</i> charge is the same calculation as done for the ex-post <i>settlement</i> charge.</p> <p>Upon receipt of an indicative finding, the <i>market participant</i> has an opportunity to provide supplementary information. Approved supplementary information will be taken into account and result in establishing actual <i>energy</i> reference quantity and actual <i>operating reserve</i> reference quantity. An indicative finding becomes a determinate finding when:</p> <ul style="list-style-type: none"> <li>• The supplementary information is not submitted by the <i>market participant</i>; or</li> <li>• The <i>IESO</i> has accepted the supplementary information and revised the reference quantity; or</li> <li>• The <i>IESO</i> has rejected the supplementary information.</li> </ul>			
Flow	Source	Target	Frequency
Market Control Entity	Facility Registration	Process P5	Per Indicative Finding/Determinative Finding
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• A market control entity refers to a person or an entity who can affect the participation of a <i>market participant's</i> resource in an <i>IESO-administered market</i>. The Authorization and Participation and Facility Registration detailed design documents along with Section 3.9.1.2 in this document provide more detail on market control entities.</li> </ul>			
Flow	Source	Target	Frequency
Price Impact Test Results	Process P4	Process P5	Per Indicative Finding/Determinative Finding
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The impact test results include day-ahead and real-time <i>energy and operating reserve</i> LMPs of a resource that failed the physical withholding price impact test.</li> </ul>			
Flow	Source	Target	Frequency
History of PW Settlement Charges on Final Settlement Statements	Market Settlement	Process P5	Per Indicative Finding/Determinative Finding

Flow	Source	Target	Frequency								
<p><b>Description:</b></p> <p>The history of physical withholding <i>settlement</i> charges is used to determine the appropriate persistence multiplier. Persistence multipliers are determined as follows:</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th colspan="2" style="background-color: #cccccc;">Persistence Multipliers</th> </tr> </thead> <tbody> <tr> <td>First instance of physical withholding by a market control entity within an 18-month period.</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Second instance of physical withholding by a market control entity within an 18-month period.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Third, and additional, instances of physical withholding by a market control entity within an 18-month period.</td> <td style="text-align: center;">3</td> </tr> </tbody> </table>				Persistence Multipliers		First instance of physical withholding by a market control entity within an 18-month period.	1	Second instance of physical withholding by a market control entity within an 18-month period.	2	Third, and additional, instances of physical withholding by a market control entity within an 18-month period.	3
Persistence Multipliers											
First instance of physical withholding by a market control entity within an 18-month period.	1										
Second instance of physical withholding by a market control entity within an 18-month period.	2										
Third, and additional, instances of physical withholding by a market control entity within an 18-month period.	3										
Flow	Source	Target	Frequency								
Ex-Post Settlement Charge	Process P5	Market Settlement	Per Determinative Finding								
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The day-ahead base <i>settlement</i> charge for a <i>dispatch day</i> is the sum of <i>settlement</i> charges across all hours of the dispatch day for which the conduct and price impact tests was failed.</li> <li>• The real-time base <i>settlement</i> charge for a <i>dispatch day</i> is the sum of <i>settlement</i> charges across all intervals of the <i>dispatch day</i> for which the conduct and price impact tests was failed.</li> <li>• If a resource fails the conduct and price impact tests for a <i>dispatch hour</i> in both the day-ahead market and the <i>real-time market</i>, the <i>IESO</i> will determine the day-ahead base <i>settlement</i> charge and the real-time base <i>settlement</i> charge for that <i>dispatch hour</i> and will levy the higher of these two base <i>settlement</i> charges.</li> <li>• The base <i>settlement</i> charge is multiplied with the persistence multiplier to determine the final ex-post <i>settlement</i> charge for physical withholding.</li> </ul>											

## 6.7 Ex-Post Mitigation for Economic Withholding on Uncompetitive Interties



**Figure 6-6: Ex-Post Mitigation of Economic Withholding on Uncompetitive Interties Process Data Flow Diagram**



## 6.7.1 Process P1: Determine Energy and OR Intertie Reference Level

### Description

Process P1 determines the *intertie* reference level for *energy* and *operating reserve*, which is an initial estimate for the price for *energy* or *operating reserve* that the *market participant* would have offered or *bid* on the uncompetitive *intertie* if competition had not been restricted. Section 3.10.1 provides details on the methodology that the *IESO* will use to derive these reference levels.

### Input and Output Data Flows

Table 6-34: Process P1 Input and Output Data Flows

Flow	Source	Target	Frequency
Boundary Entity Resources Designated Uncompetitive Interties Global Market Power Reference Interties	Facility Registration	Process P1	Updated as needed
<p><b>Description:</b></p> <p><b>Boundary Entity Resources:</b></p> <ul style="list-style-type: none"> <li>Each <i>intertie</i> contains a number of <i>boundary entity</i> resources. When <i>market participants</i> submit an import offer or export bid on an <i>intertie</i>, they select a <i>boundary entity</i> resource on that <i>intertie</i> for each offer or bid.</li> <li><i>Boundary entities</i> designated by the <i>IESO</i> into the future day-ahead market and <i>real-time market</i> will continue to be modelled by the <i>IESO</i> at the same locations as in the network model today.</li> </ul> <p><b>Uncompetitive Interties:</b></p> <ul style="list-style-type: none"> <li><i>Interties</i> are designated as uncompetitive following the Designate Uncompetitive Interties process.</li> <li>The <i>IESO</i> will designate <i>interties</i> where competition is restricted as uncompetitive <i>interties</i> and will apply mitigation measures at these uncompetitive <i>interties</i>.</li> </ul> <p><b>Global Market Power Reference Interties:</b></p> <ul style="list-style-type: none"> <li>At this time, the <i>IESO</i> considers the New York-Ontario <i>intertie</i> and the Michigan-Ontario <i>intertie</i> to be the Global Market Power Reference Interties.</li> </ul>			
Flow	Source	Target	Frequency
Intertie Border Price, Economically Scheduled Intertie Dispatch Data	Scheduling Processes Data Archive	Process P1	Hourly for DAM Five-minutes for RT
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The Intertie Border Price (IBP) is the nodal price at the Global Market Power Reference Interties, ignoring <i>intertie</i> congestion.</li> <li><i>Dispatch data</i> economically scheduled for <i>intertie</i> transactions for <i>energy</i> and <i>operating reserve</i> will be used to determine the offer-based reference price. Ninety days of historical data from the day-ahead market and <i>real-time market</i> is required in order to calculate the offer-based reference level.</li> <li></li> </ul>			

Flow	Source	Target	Frequency
Energy/OR Intertie Reference Level	Process P1	Process P2, Process P3	Daily
<b>Description:</b> <ul style="list-style-type: none"> <li>The <i>intertie</i> reference level is the offer-based reference price or the <i>intertie</i> border price (IBP) as determined by business rules.</li> <li>Reference Section 3.10 of this document.</li> </ul>			
Flow	Source	Target	Frequency
Supplementary Information	Market Participant	Process P1	On receipt of indicative finding
<b>Description:</b> <ul style="list-style-type: none"> <li>Triggered by Process P4, the <i>market participant</i> may receive an indicative finding. The indicative finding includes information such as an estimate of the settlement charge and the preliminary <i>intertie</i> reference levels. The <i>market participant</i> has the opportunity to respond to the indicative finding by providing supplementary information to the <i>IESO</i>. Relevant supplementary information could include information pertaining to the determination of the <i>intertie</i> reference level.</li> <li>If the information provided by the <i>market participant</i> changes the <i>intertie</i> reference level that the <i>IESO</i> had used in the initial conduct and impact tests, the <i>IESO</i> will re-run the conduct tests (Process P2) and price impact tests (Process P3). If the re-run still results in a failure of the conduct and price impact tests, that revised findings will be used to determine a <i>settlement</i> charge (Process P4).</li> </ul>			

## 6.7.2 Process P2: Perform Conduct Test

### Description

Process P2 applies a conduct test for any *market participant* submitting an *energy dispatch data* for a *boundary entity* resource on an uncompetitive *intertie* that meets the conditions for mitigation as described in Section 3.10.6.

The *IESO* will apply a conduct test for any *market participant* submitting an *operating reserve import dispatch data* placed for a *boundary entity* resource on an uncompetitive *intertie* that meets the conditions for mitigations as described in Section 3.10.4.

The *IESO* will apply the conduct tests for ex-post testing for *energy* and *operating reserve* make-whole payments impact for *boundary entity* resource on an uncompetitive *intertie* that meets the conditions for mitigation as described in Section 3.10.5.

## Input and Output Data Flows

**Table 6-35: Process P2 Input and Output Data Flows**

Flow	Source	Target	Frequency
Energy/OR Intertie Reference Level	Process P1	Process P2	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>intertie</i> reference level is the <i>offer</i>-based reference price or the <i>intertie</i> border price (IBP) as determined by business rules at the completion of P1.</li> </ul>			
Flow	Source	Target	Frequency
Historical Energy/OR MWP	Market Settlement	Process P2	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Historical <i>energy</i> and <i>operating reserve</i> make-whole payments that support the conduct test for make-whole payment impact on uncompetitive <i>interties</i>.</li> </ul>			
Flow	Source	Target	Frequency
Scheduled Intertie Energy/OR Dispatch Data OR Uncompetitive Intertie LMPs Energy Congestion Component	Scheduling Processes Data Archive	Process P2	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The scheduled <i>intertie energy</i> and <i>operating reserve dispatch data</i> is the as-submitted hourly <i>dispatch data</i> for <i>energy</i> and <i>operating reserve</i> for the <i>boundary entity</i> resources on the uncompetitive <i>interties</i> that is consumed by the DAM and/or RT calculation engines.</li> <li>The <i>operating reserve</i> uncompetitive <i>intertie</i> LMPs are from the DAM and RT calculation engines.</li> <li>The <i>energy</i> congestion component of the DAM and RT LMPs on the uncompetitive <i>interties</i>. This is the domestic congestion component, and not the <i>intertie</i> congestion.</li> </ul>			
Flow	Source	Target	Frequency
Conduct Thresholds Energy/OR Conditions	MPM Information System	Process P2	Updated as needed.

**Description:**

The conduct thresholds are described below:

**Conduct Thresholds for Mitigation for Energy Price Impact on Uncompetitive Interties:**

- *Energy offer:* Offer or bid price is greater than either 200% or \$100/MWh above *intertie* reference level value; offers and bids below \$25/MWh are excluded from economic withholding tests.

**Conduct Thresholds for Mitigation for Operating Reserve Price Impact on Uncompetitive Interties:**

- *Operating reserve offer:* Offer price is greater than either 50% or \$25/MW above reference level value; offers below \$5/MW excluded from economic withholding tests.

**Conduct Thresholds for Mitigation for Make-Whole Impact on Uncompetitive Interties:**

- *Operating reserve offer:* Offer price is greater than either 50% or \$25/MW above reference level value
- *Energy offer:* Offer price is greater than either 200% or \$100/MWh above *intertie* reference level value
- Conditions required to perform conduct test on *energy*, *operating reserve* and make-whole payments are described below:

**Conditions for Energy Price Impact on Uncompetitive Interties:**

The resource will be eligible for ex-post testing for *energy* price impact on an uncompetitive *intertie* if:

- There is a positive congestion component for *energy* on an uncompetitive *intertie* greater than a threshold value of \$25/MWh; or
- The *energy offer* or *bid* price is above \$25/MWh.

**Conditions for Operating Reserve Price Impact on Uncompetitive Interties:**

- If there is an *operating reserve* price on an uncompetitive *intertie* greater than a threshold value of \$15/MW, the resource will be eligible for ex-post testing for *operating reserve* price impact on an uncompetitive *intertie*.

**Conditions for Make-Whole Payment Impact on Uncompetitive Interties:**

If a resource meets any one of the following conditions, that resource will be eligible for ex-post testing for make-whole payment impact on an uncompetitive *intertie*:

- The resource has an *operating reserve offer* at a price of \$5/MW or greater; or
- The resource was tested for an *energy* price impact on an uncompetitive *intertie*; or
- The resource was tested for an *operating reserve* price impact on an uncompetitive *intertie*.
- The resource was scheduled to provide *operating reserve* on an uncompetitive *intertie* and will otherwise receive a make-whole payment greater than \$10,000.

Flow	Source	Target	Frequency
Conduct Test Results	Process P2	Process P3	Daily

**Description:**

- The conduct test determines if the scheduled *intertie energy* or *operating reserve dispatch data* value is greater than the *intertie* reference level plus the relevant conduct threshold.
- In addition to pass/fail flag, the conduct test results will include DAM *energy* and *operating reserve* mitigated for conduct *dispatch data* for the boundary entities on the uncompetitive *interties*. These results will support the price impact test.

### 6.7.3 Process P3: Perform Price Impact Test/Simulation Exercises

#### Description

Process P3 involves the ex-post analysis of market impact due to economic withholding on uncompetitive *interties* by running market simulations.

The *IESO* will perform the price impact test for economic withholding uncompetitive *interties* on resources that meet all the conditions described Section 3.10 and fail any of the conduct tests.

#### Input and Output Data Flows

**Table 6-36: Process P3 Input and Output Data Flows**

Flow	Source	Target	Frequency
Historical DAM/RT Calculation Engine Input Data	Scheduling Processes Data Archive	Process P3	Whenever a simulation exercise is required.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>In order to simulate DAM/RT trading periods, the simulation exercise requires the historical calculation engines inputs over the study period. These inputs were previously captured after each run of the DAM and RT calculation engines and were saved to the Scheduling Processes Data Archive.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR Price Impact Thresholds on Uncompetitive Interties, Energy/OR MWP Impact Thresholds on Uncompetitive Interties	MPM Information System	Process P3	On change of thresholds.
<p><b>Description:</b></p> <p>The uncompetitive <i>intertie</i> impact thresholds are described below:</p> <p><b>Impact Threshold for Mitigation for Energy Price Impact on Uncompetitive Interties:</b></p> <ul style="list-style-type: none"> <li>Uncompetitive <i>Interties (Energy offer)</i>: As-offered <i>energy</i> LMP is 100% or \$50/MWh above the reference level <i>energy</i> LMP.</li> </ul> <p><b>Impact Thresholds for Mitigation for Operating Reserve Price Impact on Uncompetitive Interties:</b></p> <ul style="list-style-type: none"> <li>Uncompetitive <i>Interties (Operating Reserve)</i>: As-offered <i>operating reserve</i> LMP is 50% or \$25/MW above the reference level <i>operating reserve</i> LMP.</li> </ul> <p><b>Impact Thresholds for Mitigation for Make-Whole Payment Impact on Uncompetitive Interties:</b></p> <ul style="list-style-type: none"> <li>Uncompetitive <i>Interties (Energy and Operating Reserve)</i>: Make-whole payment based on the <i>dispatch data</i> used to set schedules and prices is more than 10% higher than the make-whole payment based on reference level values for <i>offer</i> parameters which failed the conduct test.</li> </ul>			
Flow	Source	Target	Frequency
Simulation Exercises	Process P3	Simulation Tool	Whenever a simulation exercise is required

<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• A baseline simulation is performed by running the simulation of DAM and RT calculation engines using the relevant set of historical calculation engines input data. These baseline simulation results are compared with the actual historical DAM and RT calculation engine results to ensure accuracy of the input data.</li> <li>• A reference level simulation is performed by running the simulation of DAM and RT calculation engines using a modified set of calculation engine input data (e.g., modified <i>dispatch data</i>). In the reference level simulation, the <i>energy</i> and <i>operating reserve offer/bid</i> prices that failed the conduct test are replaced with their respective <i>intertie</i> reference levels.</li> </ul>			
Flow	Source	Target	Frequency
Simulation Results	Simulation Tool	Process P3	Whenever a simulation exercise is required
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The simulation exercises provide an alternate valuation of the <i>intertie</i> LMPs, which are used to perform the price impact test.</li> </ul>			
Flow	Source	Target	Frequency
Price Impact Test Results	Process P3	Process P4	Per simulation exercise
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• As described in Section 3.10, the price impact tests assess impact to <i>energy</i> and <i>operating reserve</i> LMPs and make-whole payments of a <i>boundary entity</i> resource in day-ahead and real-time.</li> <li>• The price impact test compares baseline simulation LMPs with reference level simulation LMPs of the <i>boundary entity</i> resource over the study period. If the difference between the two LMPs exceeds the applicable price impact thresholds (i.e., economic withholding on uncompetitive <i>interties energy</i> or <i>operating reserve</i>), then the <i>boundary entity</i> resource is deemed to have failed the price impact test for <i>energy</i> and/or <i>operating reserve</i>.</li> <li>• The price impact test also compares <i>energy</i> and <i>operating reserve</i> make-whole payments between baseline simulation and the reference level simulation. If the difference between the two make-whole payments exceeds the applicable price impact threshold (i.e. economic withholding on uncompetitive <i>interties</i> make-whole payment), then the <i>boundary entity</i> resource is deemed to have failed the price impact test for make-whole payment.</li> <li>• When price impact test results indicate a failure, the <i>boundary entity</i> resource is subject to a <i>settlement</i> charge (Process P4). No <i>settlement</i> charge is calculated if price impact test results are passed.</li> <li>• In addition to pass/fail flag, the price impact test results will include the following to support the calculation of the ex-post <i>settlement</i> charge:             <ul style="list-style-type: none"> <li>○ The scheduled quantity in MWh of the <i>boundary entity</i> resource that failed the price impact test in DAM and RT for the study period; and</li> <li>○ <i>Boundary entity</i> resources' DAM and RT <i>energy</i> and <i>operating reserve</i> reference level make-whole payments for the study period.</li> </ul> </li> </ul>			

## 6.7.4 Process P4: Calculate Ex-Post Settlement Charge

### Description

Process P4 calculates the ex-post *settlement* charge for uncompetitive *interties* for *energy* and *operating reserve* when the price impact test results indicate a failure. Section 3.10 provides details on the methodology that the *IESO* will use to calculate these charges.

In addition, this process calculates the ex-post *settlement* charge for uncompetitive *interties* for *energy* and *operating reserve* make-whole payments when the price impact test results for make-whole payment indicate a failure.

### Input and Output Data Flows

**Table 6-37: Process P4 Input and Output Data Flows**

Flow	Source	Target	Frequency
Historical DAM/RT Schedules & LMPs	Scheduling Processes Data Archive	Process P4	Per Indicative Finding/Determinative Finding
<p><b>Description:</b></p> <p>This historical data set consists of the following for each <i>boundary entity</i> resource subject to the ex-post <i>settlement</i> charge:</p> <ul style="list-style-type: none"> <li>• DAM <i>energy</i> and <i>operating reserve</i> schedules and LMPs; and</li> <li>• RT <i>energy</i> and <i>operating reserve</i> schedules and LMPs.</li> </ul>			
Flow	Source	Target	Frequency
Indicative Finding	Process P4	Market Participant	Per Indicative Finding/Determinative Finding
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The indicative findings include the preliminary (<i>energy and operating reserve</i>) <i>intertie</i> reference levels, and estimate of the <i>settlement</i> charge. The estimated <i>settlement</i> charge is the same calculation as done for the ex-post <i>settlement</i> charge.</li> <li>• Upon receipt of an indicative finding, the <i>market participant</i> has an opportunity to provide supplementary information. Approved supplementary information will be taken into account and will result in establishing the actual <i>energy intertie</i> reference level and actual <i>operating reserve intertie</i> reference level.</li> <li>• An indicative finding becomes a determinate finding when:                             <ul style="list-style-type: none"> <li>○ <i>Market participant</i> does not provide supplementary information; or</li> <li>○ The <i>IESO</i> has accepted the supplementary information and revised the <i>intertie</i> reference level for <i>energy</i> and/or <i>operating reserve</i>; or</li> <li>○ The <i>IESO</i> has rejected the supplementary information submitted by the <i>market participant</i>.</li> </ul> </li> </ul>			
Flow	Source	Target	Frequency
Price Impact Test Results	Process P3	Process P4	Per Indicative Finding/Determinative Finding

<b>Description:</b>			
<ul style="list-style-type: none"> <li>The price impact test results, as described in Process P3, are required to calculate ex-post <i>settlement</i> charge.</li> </ul>			
Flow	Source	Target	Frequency
Historical Energy/OR MWP	Market Settlement	Process P4	Per Indicative Finding/Determinative Finding
<b>Description:</b>			
<ul style="list-style-type: none"> <li>This data set includes actual <i>energy</i> and <i>operating reserve</i> make-whole payments paid to the <i>boundary entity</i> resources subject to ex-post <i>settlement</i> charge.</li> </ul>			
Flow	Source	Target	Frequency
Ex-Post Settlement Charge	Process P4	Market Settlement	Per Determinative Finding
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The calculation process for deriving the ex-post <i>settlement</i> charge for mitigation of <i>energy</i> price impact on uncompetitive <i>interties</i> in the day-ahead market and the <i>real-time market</i> is described in detail in Section 3.10.6. This <i>settlement</i> charge will only be applied if the price impact test results indicate a failure of <i>energy</i> MWs in the day-ahead market and/or the <i>real-time market</i>.</li> <li>The process for calculating the ex-post <i>settlement</i> charge for mitigation of <i>operating reserve</i> price impact on uncompetitive <i>interties</i> in the day-ahead market and the <i>real-time market</i> is described in detail in Section 3.10.4. This <i>settlement</i> charge will only be applied if the price impact test results indicate a failure of <i>operating reserve</i> MWs in the day-ahead market and/or the <i>real-time market</i>.</li> <li>The process for calculating the ex-post <i>settlement</i> charge for mitigation of <i>energy</i> and <i>operating reserve</i> make-whole payment impact on uncompetitive <i>interties</i> in the day-ahead market and the <i>real-time market</i> is described in detail in Section 3.10.5. This <i>settlement</i> charge will only be applied if the price impact test results indicate a failure of <i>energy</i> and/or <i>operating reserve</i> make-whole payments in the day-ahead market and/or the <i>real-time market</i>.</li> </ul>			



## 6.8 Designate Narrow Constrained Areas Process

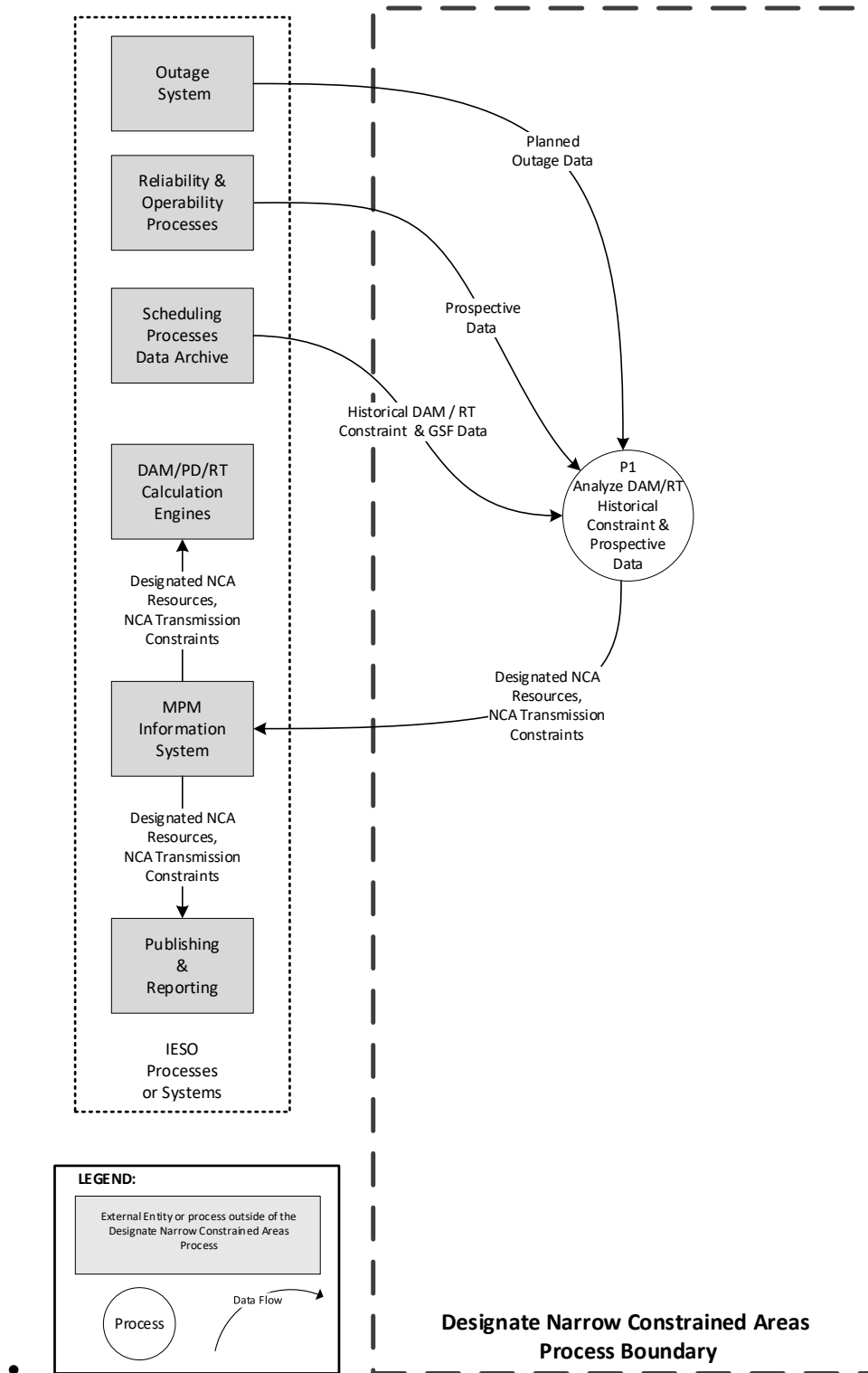


Figure 6-7: Designate Narrow Constrained Areas Data Flow Diagram

## 6.8.1 Process P1: Analyze DAM/RT Historical Constraints and Prospective Data

### Description

The IESO designates specific areas as Narrow Constrained Areas (NCAs) based on historical data from the previous year and prospective analysis that predicts where congestion is expected to continue. The NCA designation methodology is explained in detail in Section 3.12.1.

Process P1 analyzes historical constraints and prospective data to determine if a new NCA needs to be designated, an existing NCA designation retained or if an NCA designation needs to be revoked. The resources included in the NCA are also determined by this process.

### Input and Output Data Flows

**Table 6-38: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Historical DAM/RT Constraint & GSF Data	Scheduling Processes Data Archive	Process P1	Annually.
<b>Description:</b> <ul style="list-style-type: none"> <li>The enduring business process will obtain historical transmission constraints and generation shift factor (GSF) data from the day-ahead market (DAM) and <i>real-time market</i>. The historical data set is taken from the previous year.</li> <li>In order to transition from the current state to the future state under MRP, the NCAs will be designated based on the analysis of historical data obtained from the current calculation engines (DACE and Real Time). Subsequently, the NCAs will be designated based on historical constraint and GSF data obtained from the DAM and RT calculation engines.</li> </ul>			
Flow	Source	Target	Frequency
Planned Outage Data	Outage System	Process P1	Annually.
<b>Description:</b> <ul style="list-style-type: none"> <li><i>Planned outages</i> on generation and transmission facilities may be used in the assessment of NCA. <i>Planned outages</i> will be assessed based on factors such as scope, date, duration and nature of outage in order to ascertain the expected impact on congestion.</li> </ul>			
Flow	Source	Target	Frequency
Prospective Data	Reliability and Operability Processes	Process P1	Annually.
<b>Description:</b> <ul style="list-style-type: none"> <li>Prospective analysis may be performed as a predictor of where congestion is expected to continue. Prospective data may consider expectations from the Annual Planning Outlook and Reliability Outlook. More specifically reference will be made to Section 4 of the Reliability Outlook for an assessment of resource contributions to <i>reliability</i>.</li> </ul>			
Flow	Source	Target	Frequency
Designated NCA Resources, NCA Transmission Constraints	Process P1	MPM Information System	Annually.

**Description:**

- The annual NCA assessment may result in any of the following:
  - The identification of new NCA(s), relevant constraint(s) and impacted resource(s);
  - The addition or removal of resource(s) assigned to previously established NCA(s); or
  - The removal of previously established NCA(s).
- The designated NCA resources and NCA transmission constraints are recorded in the MPM Information System for use by other systems and processes.
- The *IESO* will publicly post a list of transmission constraints that are part of the NCAs, along with list of resources that are included within each NCA, at least 30 days prior to the effective date.

## 6.9 Designate Dynamic Constrained Areas Process

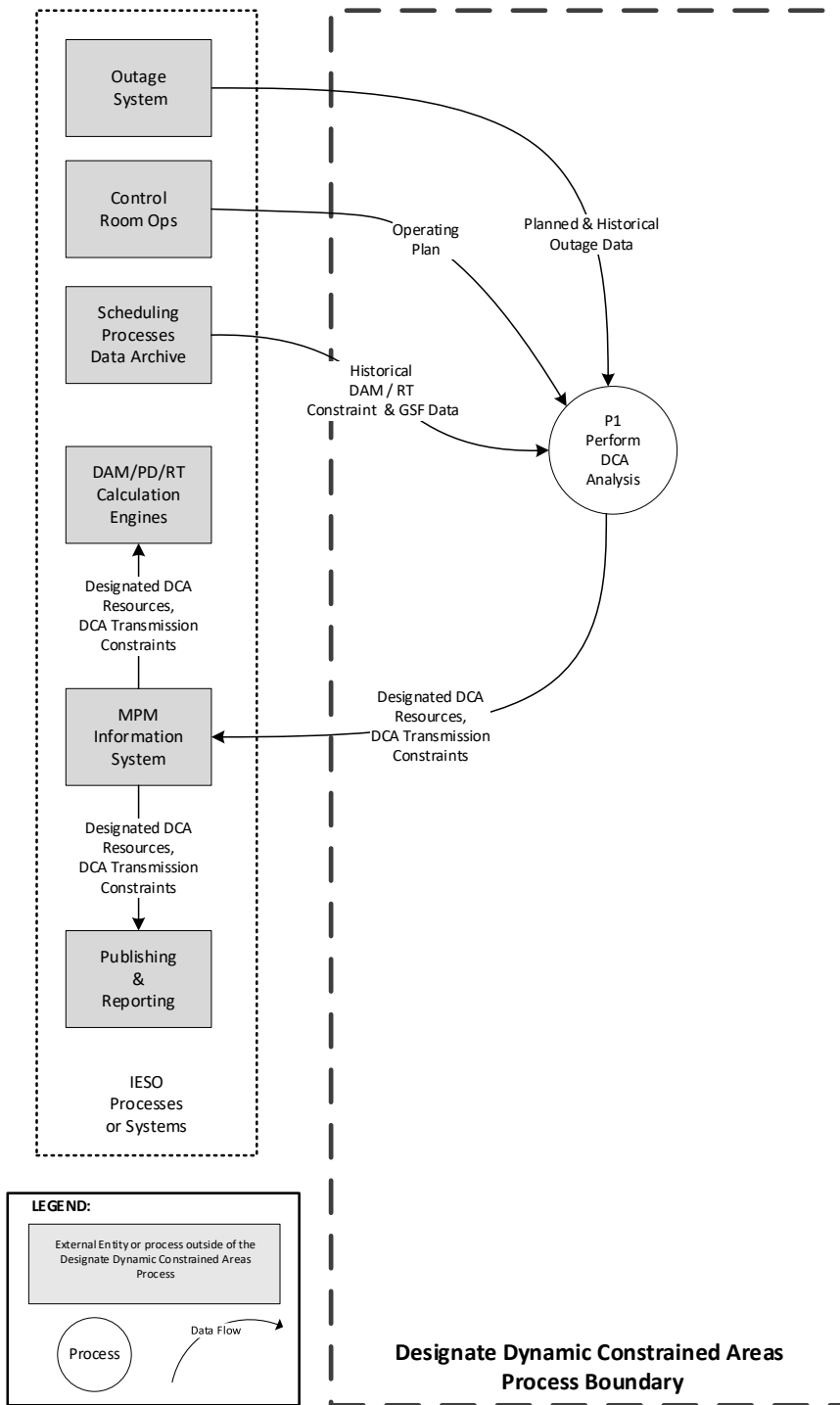


Figure 6-8: Designate Dynamic Constrained Areas Data Flow Diagram

## 6.9.1 Process P1: Perform DCA Analysis

### Description

Similar to the designation of NCAs, the *IESO* will designate areas that meet a specified set of determine as dynamically constrained areas (DCAs). These conditions and the methodology used by the *IESO* is described in Section 3.12.2.

Process P1 performs analysis that may result in the determination of a new DCA, the persistence of an existing DCA or the revocation of DCA designation. The resources included in the DCA are also determined by this process.

### Input and Output Data Flows

**Table 6-39: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Historical DAM/RT Constraint & GSF Data	Scheduling Processes Data Archive	Process P1	Daily for DAM Hourly for RT
<b>Description:</b> <ul style="list-style-type: none"> <li>Historical data set containing the transmission constraints and generation shift factor (GSF) data from the day-ahead market (DAM) and <i>real-time market</i>.</li> <li>The historical data set may include up to 5 days of previous information for the purposes of analysis.</li> </ul>			
Flow	Source	Target	Frequency
Operating Plan	Control Room Ops	Process P1	Daily after DAM As needed for RT
<b>Description:</b> <ul style="list-style-type: none"> <li>Following the completion of the DAM calculation engine on the <i>pre-dispatch day</i>, the <i>IESO</i> prepares the Operating Plan for the <i>dispatch day</i>, which consists of a number of reports detailing the various <i>IESO</i> inputs that will be used by the calculation engines, weather forecast, Surplus Baseload Generation forecast and NQS unit commitments determined by DAM.</li> <li>The Operating Plan is subsequently used to coordinate PD and RT Operations and can be updated by the <i>IESO</i> based on system conditions and to deal with contingencies.</li> <li>Expected power system conditions include <i>demand</i> forecasts, planned equipment outages, resource commitments and anticipated power flows. Operating limits and instructions describe operational limitations, preparatory control actions and alternatives for re-preparing the power system following unforeseen events (i.e. <i>forced outages</i>).</li> </ul>			
Flow	Source	Target	Frequency
Planned and Historical Outage Data	Outage System	Process P1	Daily for DAM. Hourly for RT.
<b>Description:</b> <ul style="list-style-type: none"> <li>Planned and historical <i>outage</i> data of generation and transmission <i>facilities</i> will be used in the prospective identification of dynamically constrained areas. Assessment may be based on factors such as scope, date, duration and nature of outage in order to ascertain the expected impact on congestion.</li> <li>The historical data set may include up to 5 days of previous information for the purposes of analysis.</li> </ul>			

Flow	Source	Target	Frequency
Designated DCA Resources, DCA Transmission Constraints	Process P1	MPM Information System	Daily for DAM As needed for RT
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• The DCA assessment process may result in any of the following:                             <ul style="list-style-type: none"> <li>○ The identification of new DCA(s), relevant constraint(s) and impacted resource(s); or</li> <li>○ The addition or removal of resource(s) assigned to previously established DCA(s); or</li> <li>○ The removal of previously established DCA(s).</li> </ul> </li> <li>• The designated DCA resources and DCA transmission constraints are recorded in the MPM Information System.</li> <li>• The <i>IESO</i> will publicly post a list of active DCAs, along with list of resources that are included within each DCA. The publication will identify the transmission constraints that make up the DCA. This publication may be done once for DAM, and as required during RT scheduling.</li> </ul>			

### 6.10 Designate Uncompetitive Interties Process

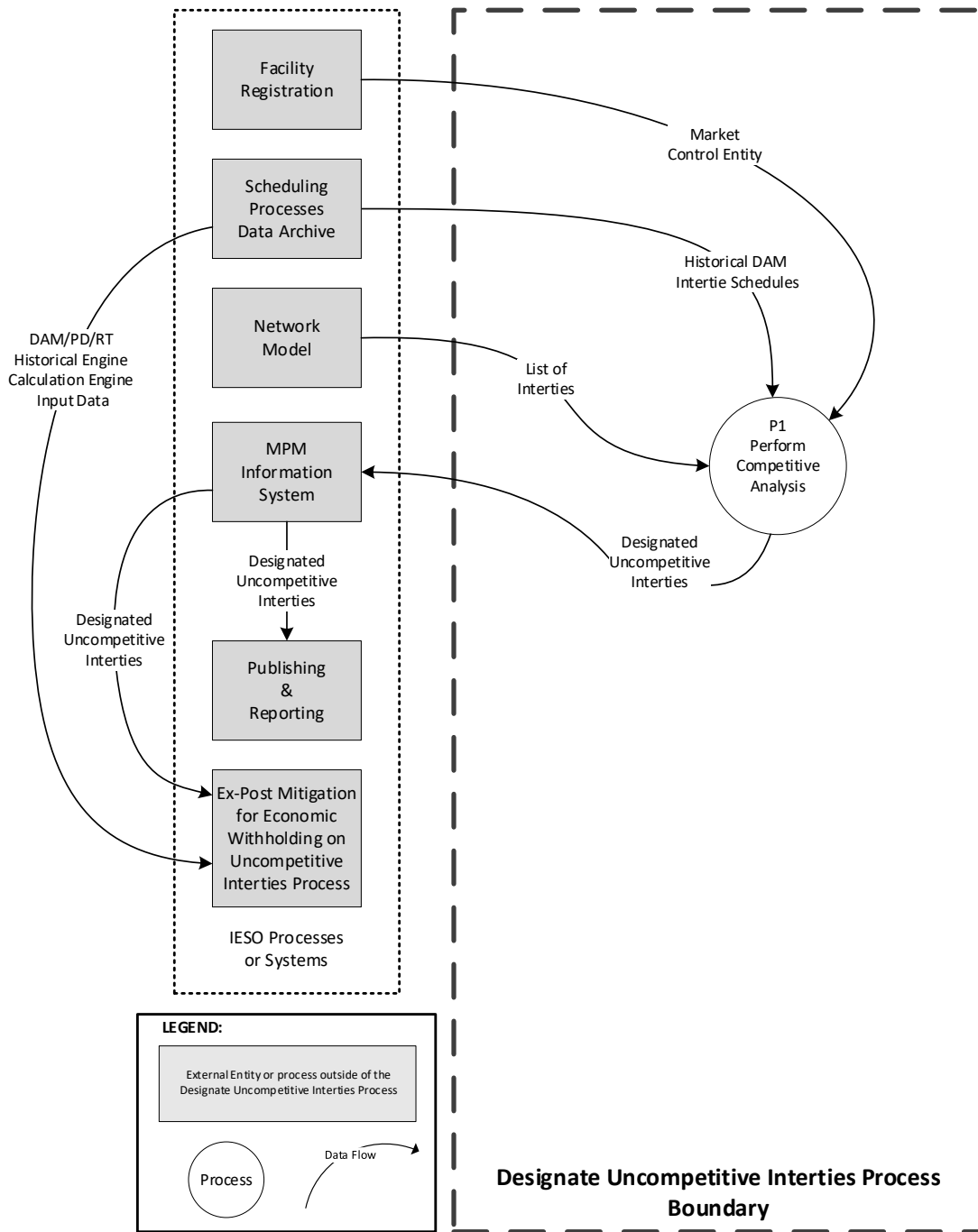


Figure 6-9: Designate Uncompetitive Interties Data Flow Diagram

## 6.10.1 Process P1: Perform Competitive Analysis

### Description

Process P1 performs competitive analysis to determine if an *intertie* should be designated as uncompetitive. It may also result in the removal of such designation. Section 3.12.5 provides details on the *IESO* methodology for designation of uncompetitive *interties*.

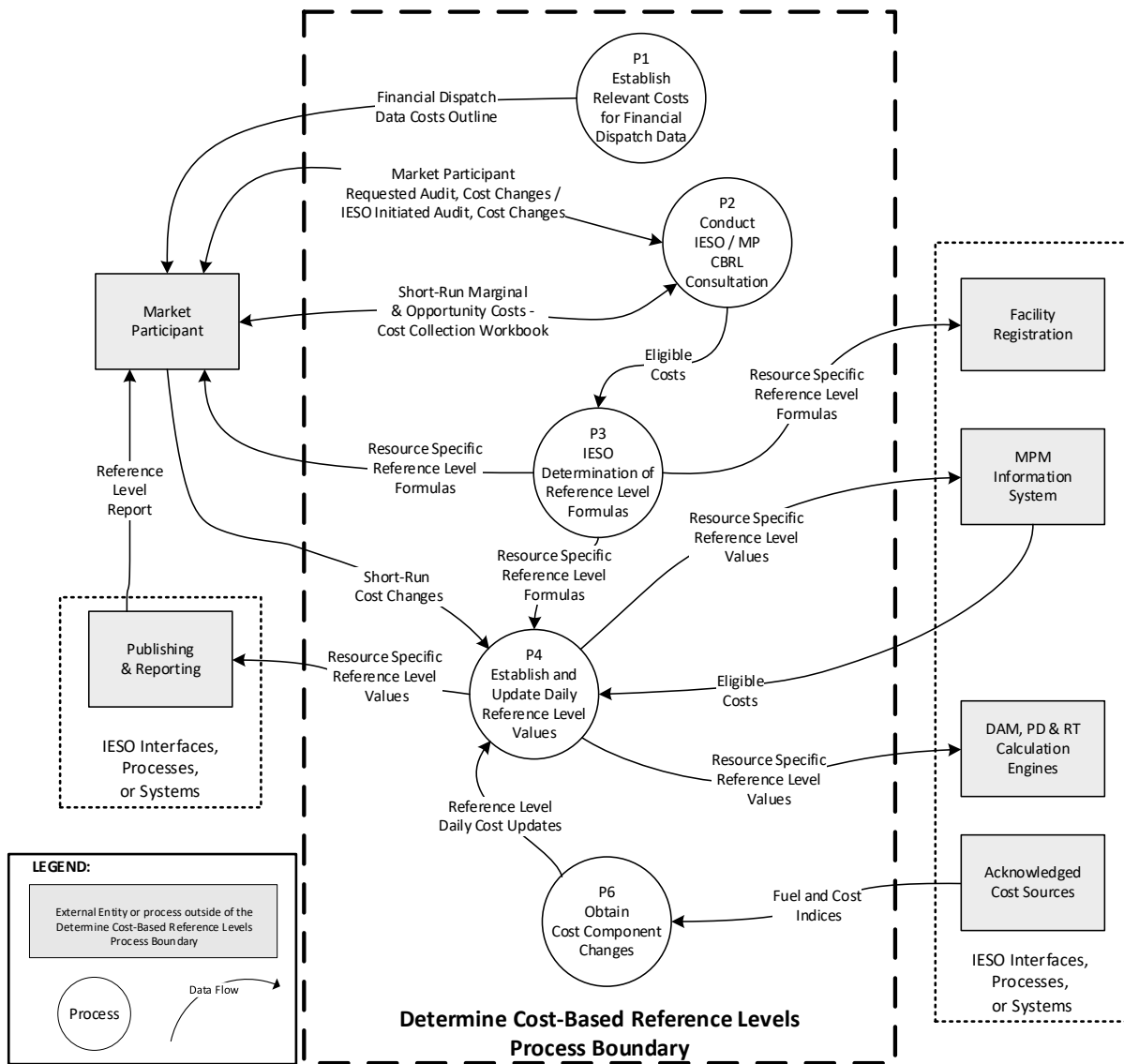
### Input and Output Data Flow

**Table 6-40: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Market Control Entity	Facility Registration	Process P1	Ongoing basis.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The market control entity is the organization(s) that has the ability to control or influence the <i>registered market participants' offer and bid</i> submissions, or control the ability to follow <i>dispatch instructions</i>. The competitive assessment takes into consideration the market control entity.</li> </ul>			
Flow	Source	Target	Frequency
Historical DAM Intertie Schedules	Settlement Processes Data Archive	Process P1	Ongoing basis.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>Ninety days of the day ahead (DAM) scheduled withdrawals or injections over the <i>intertie</i> are analyzed for competitiveness.</li> </ul>			
Flow	Source	Target	Frequency
Designated Uncompetitive Interties	Process P1	MPM Information System	Ongoing basis.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The designated uncompetitive <i>interties</i> are recorded as such in the MPM Information System. This system provides the <i>IESO</i> with a single source of truth.</li> </ul>			
Flow	Source	Target	Frequency
List of Interties	Network Model	Process P1	Ongoing basis.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The network model provides a list of <i>interties</i> that are reviewed for competitiveness.</li> <li>Monitoring for new <i>interties</i> allows for the <i>intertie</i> to be proactively assessed prior to the collection and analysis of 90 days of schedule activity.</li> </ul>			



### 6.11 Determine Cost Based Reference Levels



**Figure 6-10: Determine Cost Based Reference Levels Data Flow Diagram**

The IESO will determine reference levels for financial *dispatch data* parameters using a cost-based methodology. A cost-based methodology uses data submitted to the IESO by *market participants* to establish an approximation of each resource’s short-run marginal costs. Section 3.13 of this document provides a description of the methodology for the determination of reference levels. The following sub-processes are depicted in Figure 6-10.

## 6.11.1 Process P1: Establish Relevant Costs for Financial Dispatch Data

### Description

In Process P1, the *IESO* will provide *market participants* with a detailed outline of costs that may be included in the reference level for each financial *dispatch data* parameter that will be subject to market power mitigation conduct and impact tests.

The cost component outlines may be reviewed by the *IESO* on an as needed basis; and will be updated by the *IESO* through stakeholder process, if required. Any changes to these cost component outlines will be communicated to the *market participants*.

### Input and Output Data Flows

Table 6-41: Process P1 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Financial Dispatch Data Costs Outline	Process P1	Market Participants	Initial and subsequent changes to approved cost components
<p><b>Description:</b></p> <p>The <i>IESO</i> will establish short-run marginal cost components that may be submitted by <i>market participants</i> to establish reference levels for each financial <i>dispatch data</i> parameter by resource type. The detailed outline of cost components will address costs that may be included for the following <i>dispatch data</i> reference levels for each generation resource according to resource type:</p> <ul style="list-style-type: none"> <li>• <i>Energy</i> reference level for the <i>energy offer dispatch data</i> parameter i.e. <i>price quantity pairs</i>.</li> <li>• Speed no-load reference level for speed no-load offer <i>dispatch data</i> parameter.</li> <li>• Start-up reference level for start-up offer <i>dispatch data</i> parameter.</li> <li>• <i>operating reserve</i> reference level for <i>operating reserve offer dispatch data</i> parameter.</li> </ul> <p>The <i>IESO</i> will establish start-up reference levels and speed no-load reference levels for eligible NQS <i>generation units</i> only.</p>			

## 6.11.2 Process P2: Conduct IESO/Market Participant CBRL Consultation

### Description

The *IESO* will approve eligible costs for use in determining cost-based reference level (CBRL) formulas.

1. The *IESO* will develop cost-based reference levels for each domestic resource supplying *energy* to the *IESO-controlled grid* based on submitted documentation outlining the costs for each resource, and consultation with each *market participant*.
2. In addition, the *IESO* may perform a periodic review of all, or a subset, of the cost data to verify its completeness and accuracy. This may result in the need to re-verify or revise previously approved cost data. If the consultations with the *market participant* result in a

change in the reference level, the revised reference level formulas will be used for future transactions.

## Input and Output Data Flows

**Table 6-42: Process P2 Input and Output Data Flows**

Flow	Source	Target Processes	Frequency
Short-Run Marginal and Opportunity Costs – Cost Collection Workbook	Market Participant	Process P2	Initial and supplemental submissions
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• <i>Market participant</i>-submitted cost data for each generation resource.</li> <li>• This data will include:                             <ul style="list-style-type: none"> <li>○ Short-run marginal costs associated with the supply of incremental injections of <i>energy</i> into the <i>IESO-controlled grid</i>;</li> <li>○ Short-run marginal costs associated with operating a <i>generation unit</i> in a synchronized status while injecting no <i>energy</i> into the <i>IESO-controlled grid</i>;</li> <li>○ Short-run marginal costs associated with bringing an off-line resource through all the <i>generation unit</i> specific start-up procedures to <i>minimum loading point</i>; and</li> <li>○ Short-run marginal costs associated with preparing a resource to be able to supply incremental injections of <i>energy</i> into the <i>IESO-controlled grid</i> for the supply of <i>operating reserve</i>.</li> </ul> </li> <li>• The <i>IESO</i> may request additional supporting documentation and acceptable materials to support the <i>IESO's</i> determination of reference levels for each <i>generation unit</i> supplying <i>energy</i> and/or <i>operating reserve</i> to the <i>IESO-controlled grid</i>.</li> </ul>			
Flows	Source	Target Processes	Frequency
Eligible Costs	Process P2	Process P3	Initial and supplemental submissions
<p><b>Description:</b></p> <p>Eligible costs determined by <i>IESO's</i> assessment and consultation with <i>market participants</i>.</p> <ul style="list-style-type: none"> <li>• <i>IESO</i> will assess all submitted information for cost eligibility and appropriateness and review any other information acquired and deemed relevant.</li> <li>• <i>IESO</i>-approved eligible costs will be used to establish financial <i>dispatch data</i> reference level formulas.</li> </ul>			

Flow	Source	Target Processes	Frequency
Market Participant Requested Audit, Cost Changes	Market Participant	Process P2	Event-based – <i>market participant</i> submissions
<p><b>Description:</b></p> <p>A <i>market participant</i> may request reference level cost changes if:</p> <ul style="list-style-type: none"> <li>• The <i>market participant</i> identifies a need for a cost data audit or review for completeness and accuracy and a consultation is initiated between <i>the market participant</i> and the <i>IESO</i> to revise the reference level formulas due to changes to its <i>facility</i>; or</li> <li>• The <i>market participant</i> notifies the <i>IESO</i> of an increase or decrease in initially submitted costs excluding fuel and opportunity costs.</li> </ul>			
Flow	Source	Target Processes	Frequency
IESO Initiated Audit, Cost Changes	Market Participant	Process P2	Event-based, <i>IESO</i> initiated changes
<p><b>Description:</b></p> <p>The <i>IESO</i> may initiate reference level cost changes if:</p> <ul style="list-style-type: none"> <li>• The <i>IESO</i> makes changes to the cost-based reference level methodology that warrants a revision to the initially determined reference levels; or</li> <li>• The <i>IESO</i> identifies a need for a cost data audit or review for completeness and accuracy and a consultation is initiated between the <i>market participant</i> and the <i>IESO</i> to revise the reference level.</li> </ul>			

### 6.11.3 Process P3: IESO Determination of Reference Level Formulas

#### Description

Process P3 involves the development of cost-based reference level formulas by the *IESO* for each domestic resource supplying *energy* to the *IESO-controlled grid*. The *IESO* determines these formulas based on submitted documentation outlining the costs for each resource, and consultation with each *market participant*. These formulas will be established for *energy offers*, speed no-load offers, start-up offers, and *operating reserve offers* using the approved cost components.

#### Input and Output Data Flows

**Table 6-43: Process P3 Input and Output Data Flows**

Flows	Source	Target Processes	Frequency
Eligible Costs	Process P2	Process P3	Initial and supplemental submissions
<b>Description:</b> <ul style="list-style-type: none"> <li>Eligible costs determined by <i>IESO</i> assessment and consultation with <i>market participants</i>.</li> </ul>			
Flows	Source	Target Processes	Frequency
Approved Cost Components	Process P3	MPM Information System	Initial and supplemental submissions
<b>Description:</b> <ul style="list-style-type: none"> <li><i>IESO</i> approved cost components will be used in reference level formulas to calculate resource specific reference level values.</li> </ul>			
Flow	Source	Target Processes	Frequency
Resource Specific Reference Level Formulas	Process P3	Market Participant	As approved by the <i>IESO</i>
<b>Description:</b> <ul style="list-style-type: none"> <li>The <i>IESO</i> notifies the <i>market participant</i> of the approved resource-specific reference level formulas.</li> <li>The <i>market participant</i> may provide updated supporting documentation and acceptable materials to support revision to the approved reference level formulas (via the ‘Short-Run Marginal &amp; Opportunity Costs – Cost Collection Workbook’ submitted to process P2).</li> </ul>			

Flows	Source	Target Processes	Frequency
Resource Specific Reference Level Formulas	Process P3	Process P4 & Facility Registration	As approved by the IESO
<p><b>Description:</b></p> <p>IESO will determine and record reference level formulas for each <i>generation unit</i> supplying energy and/or <i>operating reserve</i> to the IESO-controlled grid.</p> <ul style="list-style-type: none"> <li>• These reference level formulas represent: <ul style="list-style-type: none"> <li>○ <i>Energy offer</i> reference level curve for each <i>dispatch data</i> submission expressed in terms of inputs (e.g. fuel costs) to form a monotonically increasing cost curve.</li> <li>○ Speed no-load offer reference levels expressed in terms of inputs (e.g. fuel costs) for each hour.</li> <li>○ Start-up offer reference levels expressed in terms of inputs (e.g. fuel costs) for each hour for each thermal state.</li> <li>○ <i>Operating reserve offer</i> reference level curve expressed in terms of inputs (e.g. fuel costs) to form a monotonically increasing cost curve.</li> </ul> </li> <li>• Reference levels formulas will apply to all <i>dispatch hours</i> of a <i>trading day</i>.</li> </ul>			

#### 6.11.4 Process P4: Establish and Update Daily Reference Level Values

##### Description

IESO-reference level formulas will remain in effect subject to determined changes or updates initiated by the IESO or *market participants*. Process P4 establishes and updates resource-specific reference level values for each *trading day*. These will be utilized by the DAM, PD and RT calculation engines and also *published* confidentially to each *market participant*.

If prior to market scheduling, a *market participant* requests changes to its short-run marginal costs for the *trading day* within the specified timelines, the IESO will review the request and approve or reject the change to the calculated resource-specific reference level values. If change is approved by the IESO, the revised resource-specific reference level values will be *published* and used in the calculation engines.

## Input and Output Data Flows

**Table 6-44: Process P4 Input and Output Data Flows**

Flows	Source	Target Processes	Frequency
Reference Level Formulas	Process P3	Process P4	As approved by the <i>IESO</i>
<p><b>Description:</b></p> <p><i>IESO</i>-determined reference level formulas for each <i>generation unit</i> supplying <i>energy</i> and/or <i>operating reserve</i> to the <i>IESO</i>-controlled grid.</p> <ul style="list-style-type: none"> <li>• These reference level formulas represent:                             <ul style="list-style-type: none"> <li>○ <i>Energy offer</i> reference level curve for each <i>dispatch data</i> submission expressed in terms of inputs (e.g. fuel costs) to form a monotonically increasing cost curve.</li> <li>○ Speed no-load offer reference levels expressed in terms of inputs (e.g. fuel costs) for each hour.</li> <li>○ Start-up offer reference levels expressed in terms of inputs (e.g. fuel costs) for each hour for each thermal state.</li> <li>○ <i>Operating reserve offer</i> reference level curve expressed in terms of inputs (e.g. fuel costs) to form a monotonically increasing cost curve.</li> </ul> </li> <li>• Reference levels formulas will apply to all <i>dispatch hours</i> of a <i>trading day</i>.</li> </ul>			
Flows	Source	Target Processes	Frequency
Approved Cost Components	MPM Information System	Process P4	Daily
<p><b>Description:</b></p> <p>Approved cost components as determined by <i>IESO</i>'s assessment and consultation with <i>market participants</i>.</p> <ul style="list-style-type: none"> <li>• <i>IESO</i>-approved cost components will be used in reference level formulas to calculate resource specific reference level values.</li> </ul>			

Flows	Source	Target Processes	Frequency
Reference Level Daily Cost Updates	Process P5	Process P4	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will update certain cost components of the reference levels initially determined by the <i>IESO</i> in consultation with <i>market participants</i>.</li> <li>These cost components include:                             <ul style="list-style-type: none"> <li>Fuel costs for natural gas;</li> <li>Fuel costs for oil;</li> <li>Fuel costs for diesel;</li> <li>Fuel costs for bio fuel and other similar resources; and</li> <li>Opportunity costs for hydroelectric and storage resources.</li> </ul> </li> <li>These updates are intended to avoid the necessity for <i>market participants</i> to submit new cost data every day, enabling the <i>IESO</i> to perform updates on a periodic or as-required basis.</li> </ul>			
Flow	Source	Target Processes	Frequency
Resource Specific Reference Level Values	Process P4	Publishing and Reporting	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will <i>publish</i> confidential reports containing resource-specific reference level values to each <i>market participant</i> on a daily basis.</li> <li>These reports will show the reference level values for financial <i>dispatch data</i> parameters for each resource applicable to the <i>trading day</i>.</li> </ul>			
Flow	Source	Target Processes	Frequency
Resource Specific Reference Level Values	Process P4	DAM, PD and RT Calculation Engines	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will ensure that resource-specific reference level values for each resource supplying <i>energy</i> and/or <i>operating reserve</i> to the <i>IESO-controlled grid</i> is made available and utilized by the DAM, PD and RT calculation engines.</li> <li>These reference level values are used for the ex-ante market power mitigation for economic withholding processes and settlement mitigation for make-whole payment impact.</li> </ul>			
Flow	Source	Target Processes	Frequency
Resource Specific Reference Level Values	Process P4	MPM Information System	Daily
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The <i>IESO</i> will ensure that resource-specific reference level values for each <i>resource</i> supplying <i>energy</i> to the <i>IESO-controlled grid</i> is recorded in the <i>IESO's</i> information systems.</li> </ul>			



### 6.11.5 Process P5: Obtain Daily Cost or Component Inputs

#### Description

Certain cost components of the reference levels that are initially determined by the *IESO* in consultation with *market participants* will be updated by the *IESO* as frequently as is necessary. These components include fuel costs for natural gas, oil, diesel, biofuel and other similar resources and opportunity costs for hydroelectric and storage resources.

#### Input and Output Data Flows

**Table 6-45: Process P5 Input and Output Data Flows**

Flow	Source	Target Processes	Frequency
Fuel and Cost Indices	Acknowledged Cost Sources	Process P5	Daily
<p><b>Description:</b></p> <p>Fuel costs and other cost indices will be retrieved by the <i>IESO</i> on a daily basis to calculate resource-specific reference level values. These costs indices will include:</p> <ul style="list-style-type: none"> <li>• Relevant fuel costs indices; and</li> <li>• Inputs required to calculate opportunity costs for relevant resources.</li> </ul>			
Flow	Source	Target Processes	Frequency
Reference Level Daily Cost Inputs	Process P5	Process P4	Daily
<p><b>Description:</b></p> <p>The <i>IESO</i> will update affected reference level values without <i>market participant</i> consultation based on ongoing relevant cost changes. The resource-specific resource level value updates will be:</p> <ul style="list-style-type: none"> <li>• Communicated to the DAM, PD and RT calculation engines; and</li> <li>• <i>Published</i> in confidential resource-specific reference level reports to each <i>market participant</i>.</li> </ul>			

## 6.12 Settlement Mitigation of Request to Use Higher-Cost Fuel

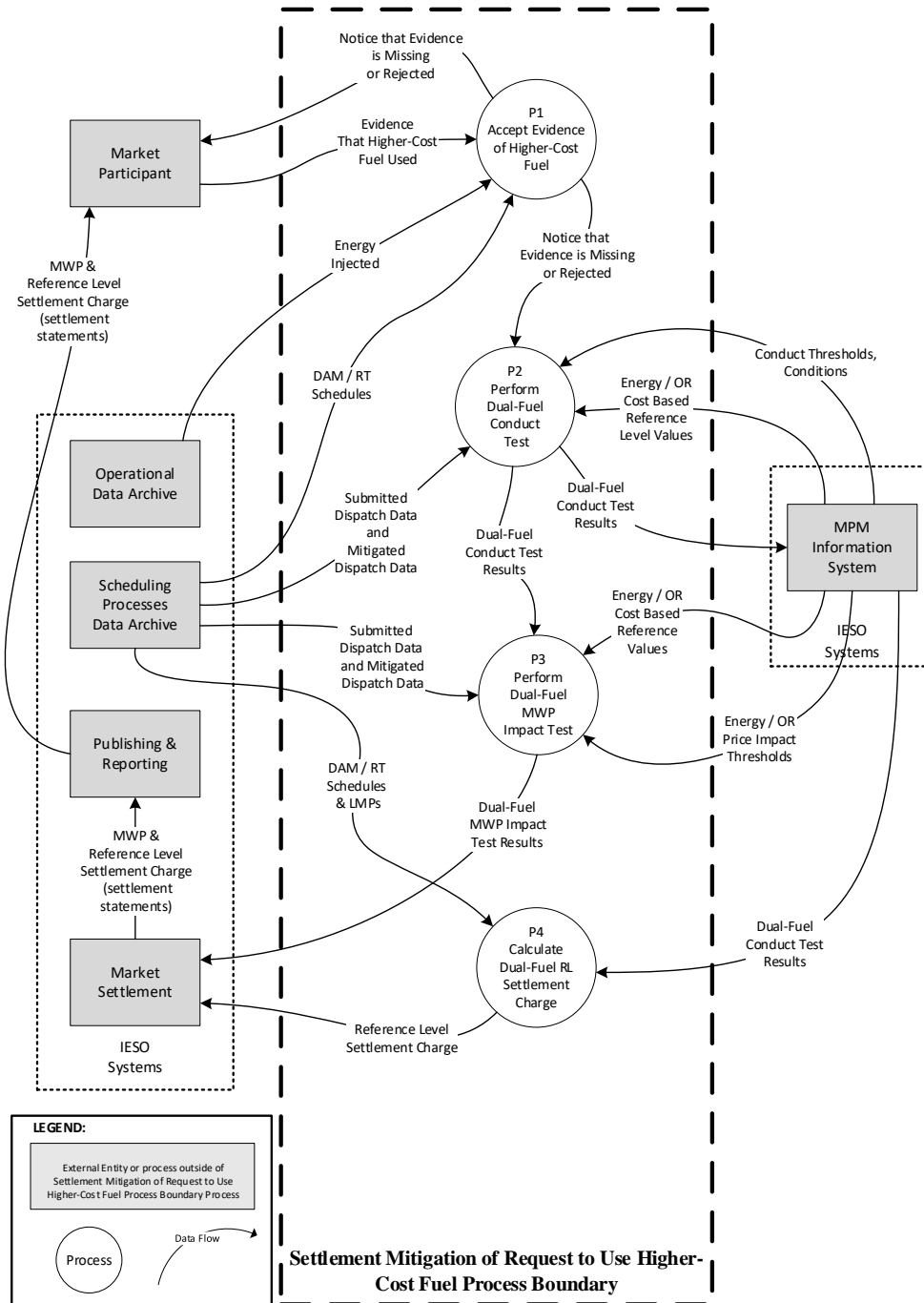


Figure 6-11: Settlement Mitigation of Request to Use Higher Cost Fuel

## 6.12.1 Process P1: Accept Evidence of Higher-Cost Fuel

### Description

*Market participants* who have registered dual-fuel resources with the *IESO* will have the option to request the use of higher-cost fuel reference levels as described in Section 3.13.1.2.

The ‘Settlement Process for Mitigating Dual Fuel Resources’ process is outlined in the Section 3.13.1.2 sub-section and described in processes P1-P4 below.

When a dual-fuel resource receives a DAM or RT schedule having requested the use of a higher cost fuel, the *IESO* will allow the *market participant* to submit evidence of use of higher-cost fuel. This evidence must be provided within two *business days* after the *trading day* in which the higher-cost fuel was used. The *IESO* will provide acknowledgement to the *market participant* as follows:

- when the evidence is not found to be acceptable; or
- when the evidence is not received within the prescribed timelines.

If the *market participant* fails to provide supporting information demonstrating the use of the higher-cost fuel within the specified time, or if the *IESO* does not find the provided evidence satisfactory, then the *IESO* will repeat the conduct test in the settlement timeframe using the lower reference level (P2).

If the *IESO* finds the evidence to be satisfactory, no further actions will be taken.

### Input and Output Data Flows

**Table 6-46: Process P1 Input and Output Data Flows**

Flow	Source	Target	Frequency
Evidence That Higher-Cost Fuel Used	Market Participant	Process P1	Within two <i>business days</i> after the <i>trading day</i> when the <i>market participant</i> placed a request to use the higher-cost fuel in either the DA or PD timeframes
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• Written evidence that documents the reasons that will be considered acceptable for a <i>market participant</i> to request the <i>IESO</i> to use a reference level based on a more expensive fuel type. The details of valid reasons are listed in Section 3.13.1.2.</li> </ul>			
Flow	Source	Target	Frequency
Energy Injected	Meter Data Management System	Process P1	Within two <i>business days</i> after the <i>trading day</i> when the <i>market participant</i> placed a request to use the higher-cost fuel in either the DA or PD timeframes.  Telemetry captured when the dual-fuel resource injects in RT.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>• The actual <i>energy</i> injected (i.e., Allocated Quantity of Energy Injection) by the dual-fuel resource to the <i>IESO-controlled grid</i> for the period when operating using the higher-cost fuel.</li> </ul>			

Flow	Source	Target	Frequency
DAM/RT Schedules	Scheduling Processes Data Archive	Process P1	Within two <i>business days</i> after the <i>trading day</i> when the <i>market participant</i> placed a request to use the higher-cost fuel in either the DA or PD timeframes.  Schedules recorded when the dual-fuel resource is scheduled in DAM/RT.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The DAM schedules and <i>real-time schedules</i> of the dual-fuel resource for the period the dual-fuel resource obtained <i>IESO's</i> pre-approval to use higher-cost fuel and prior to getting DAM/RT schedule.</li> </ul>			
Flow	Source	Target	Frequency
Notice That Evidence Is Missing or Rejected	Process P1	Process P2 & Market Participant	Daily if missing or rejected fuel cost evidence identified.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>Notice to the <i>market participant</i> when required evidence was not received by the <i>IESO</i> within the predefined timelines or when the submitted evidence was rejected by the <i>IESO</i>.</li> <li>Following this notice, the <i>IESO</i> will perform the dual-fuel resource conduct test (P2).</li> </ul>			

## 6.12.2 Process P2: Perform Dual-Fuel Conduct Test

### Description

Process P2 performs the dual-fuel conduct test using mitigated *dispatch data* with lower reference levels. The ex-ante conduct tests calculated mitigated *dispatch data* using the higher reference level for the fuel cost approved prior to scheduling.

After the *market participant* places a request to use the higher-cost fuel in either of the timeframes, they must provide evidence to the *IESO* that the higher-cost fuel was used. This evidence must be provided within two *business days* after the *trading day* in which the higher-cost fuel was used. If the *market participant* fails to provide supporting information demonstrating the use of the higher-cost fuel within the specified time or if the *IESO* does not find the provided evidence satisfactory, then:

- The *IESO* will repeat the conduct test in the settlement timeframe using the lower reference level.
- If this conduct test in the settlement timeframe using the lower reference level passes, then no further steps in this process are necessary.
- If for any MWhs tested, the conduct test in the settlement timeframe is failed using the lower reference level, then the results are passed to process P3 “Perform Dual-Fuel MWP Impact Test” and to process P4 “Calculate Dual-Fuel Reference Level Settlement Charge”.

## Input and Output Data Flows

**Table 6-47: Process P2 Input and Output Data Flows**

Flow	Source	Target	Frequency
Notice That Evidence Is Missing or Rejected	Process P1	Process P2	Daily if missing or rejected fuel cost evidence identified
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Notice to the <i>market participant</i> when required evidence was not received by the <i>IESO</i> within the predefined timelines or when the submitted evidence was rejected by the <i>IESO</i>.</li> </ul>			
Flow	Source	Target	Frequency
Submitted Dispatch Data and Mitigated Dispatch Data	Scheduling Processes Data Archive	Process P2	Retrieved when process P2 is triggered upon missing or rejected fuel cost evidence
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li><i>Market participant</i>-submitted <i>dispatch data</i> and any related mitigated <i>dispatch data</i> (i.e., parameters substituted with the lower reference levels).</li> </ul>			
Flow	Source	Target	Frequency
Conduct Thresholds, Conditions	MPM Information System	Process P2	Retrieved when process P2 is triggered  Updates: Conduct Thresholds; only when updated  Conditions; only when updated
<p><b>Description:</b></p> <p>The conduct test requires conduct thresholds, and the conditions for mitigation, which are described below;</p> <p><b>Conduct Thresholds</b></p> <p>Details for conduct thresholds may be found in Section 3.6 and include:</p> <ul style="list-style-type: none"> <li>Conduct Thresholds for Price Impact Testing for NCAs and DCAs (Table 3-5: Conduct Thresholds for Price Impact Testing for NCAs and DCAs);</li> <li>Conduct Thresholds for Price Impact Testing for BCAs (Table 3-7: Conduct Thresholds for Price Impact Testing for BCA);</li> <li>Conduct Thresholds for Price Impact Testing for Local Market Power – Operating Reserve (Table 3-11: Conduct Thresholds for Price Impact Testing for Local Market Power–Operating Reserve; and</li> <li>Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve (Table 3-13: Conduct Thresholds for Price Impact Testing for Global Market Power – Operating Reserve.</li> </ul> <p><b>Conditions for Mitigation for Price Impact</b></p> <p>Details may be found in Section 3.4 and include:</p>			

- Mitigation Conditions for Energy and Operating Reserve Price Impact Testing (Table 3-2: Mitigation Conditions for Energy and Operating Reserve Price Impact Testing)

**Narrow Constrained Areas (NCAs):**

- The conduct test requires the NCA designated resources and the designated NCA transmission constraints.
- The criteria for the designation of NCAs may be found in Section 3.12.

**Dynamic Constrained Areas (DCAs):**

The conduct test requires the DCA designated resources and the designated DCA transmission constraints.

The designation of DCAs may be found in Section 3.12.

Flow	Source	Target	Frequency
Energy/OR Cost Based Reference Level values	MPM Information System	Process P2	Retrieved when process P2 is triggered  Updates: Cost Based Reference Level values; daily frequency

**Description:**

The conduct test requires cost-based reference level values for each resource, which are described below:

**Cost Based Reference Level Values**

- Details regarding cost-based reference levels as described in Section 3.13.
- For the ex-post dual-fuel resource mitigation, the *IESO* will establish two sets of above noted applicable reference levels as follows:
  - Lower-cost fuel, which will be considered default set of reference levels for ex-ante mitigation; and
  - Higher-cost fuel, which will be used in ex-ante mitigation only if pre-approved by the *IESO* ahead of DAM/RT market scheduling.
- This will result in two sets of reference level values for each of the four applicable parameters listed above. MPM Information System will make both sets of reference level values available to this process (P2).

Flow	Source	Target	Frequency
Dual-Fuel Conduct Test Results	Process P2	Process P3, MPM Information System	When P2 is run.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Results of Dual-Fuel Conduct Test. The conduct test will determine if select financial <i>dispatch data</i> values submitted by a <i>market participant</i> for a resource differ from lower reference levels by more than the relevant conduct threshold.</li> <li>• If for any MWhs tested, the conduct test is failed in the <i>settlement</i> timeframe using the lower reference level, results are provided to Process P3 and MPM Information System, and include: <ul style="list-style-type: none"> <li>○ Dual-Fuel Conduct Test pass/fail indicator for each <i>dispatch data</i> parameter, and</li> <li>○ Any applicable mitigated for conduct offers for <i>energy, operating reserve, speed no-load, and start up.</i></li> </ul> </li> <li>• If this conduct test in the <i>settlement</i> timeframe using the lower reference level passes, then no further steps in this process are necessary. The results are recorded in MPM Information System.</li> <li>• Note that in the event of missing evidence, process P2 must perform the conduct test using the lower reference level.</li> </ul>			

### 6.12.3 Process P3: Perform Dual-Fuel MWP Impact Test

#### Description

If a resource fails the dual-fuel conduct test using the lower reference level for any MWhs, then the IESO will perform dual-fuel make-whole payment impact test.

The dual-fuel make-whole payment impact test compares make-whole payment using as-submitted *dispatch data* with make-whole payment using lower reference levels. If the make-whole payment using as-submitted *dispatch data* exceeds make-whole payment using lower reference levels plus the applicable *energy* or *operating reserve* price impact thresholds, then the Dual-Fuel MWP Impact Test is deemed to have failed.

If any MWhs failed the dual-fuel make-whole payment impact test, then the IESO will apply make-whole payment to the dual-fuel resource using the lower reference level. Otherwise, the make-whole payment will be paid using as-submitted *dispatch data* (i.e., mitigated using higher reference level).

#### Input and Output Data Flows

Table 6-48: Process P3 Input and Output Data Flows

Flow	Source	Target	Frequency
Dual-Fuel Conduct Test Results	Process P2	Process P3	When P2 results in failed conduct test
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>Results of Dual-Fuel Conduct Test from P2.</li> <li>If for any MWhs tested, the Dual-Fuel Conduct Test is failed using the lower reference level, results are provided to Process P3 and include:                             <ul style="list-style-type: none"> <li>Dual-Fuel Conduct Test pass/fail indicator for each <i>dispatch data</i> parameter; and</li> <li>Any applicable mitigated for conduct <i>dispatch data</i> for <i>energy</i>, <i>operating reserve</i>, speed no-load, and start up.</li> </ul> </li> <li>If Dual-Fuel Conduct Test results indicate a pass, then no further tests in process P3 are performed.</li> </ul>			
Flow	Source	Target	Frequency
Energy/OR MWP Impact Thresholds	MPM Information System	Process P3	Retrieved when Dual Fuel Conduct Test Results indicate failure.
<p><b>Description:</b></p> <p>Details regarding <i>energy</i> and <i>operating reserve</i> make-whole payment impact thresholds may be found in Section 3.8, and are included below:</p> <ul style="list-style-type: none"> <li>Make-Whole Payment Impact Threshold for NCAs and DCAs (Table 3-16);</li> <li>Make-Whole Payment Impact Threshold for BCAs (Table 3-18);</li> <li>Make-Whole Payment Impact Threshold for Reliability Constraints (Table 3-20);</li> <li>Make-Whole Payment Impact Threshold for Global Market Power – Energy (Table 3-22);</li> <li>Make-Whole Payment Impact Threshold for Local Market Power – Operating Reserve (Table 3-24); and</li> <li>Make-Whole Payment Impact Threshold for Global Market Power – Operating Reserve (Table 3-26).</li> </ul>			



Flow	Source	Target	Frequency
Energy/OR Cost Based Reference Level values	MPM Information System	Process P3	Retrieved when process P3 is triggered.  Updates: Cost Based Reference Level Values; daily frequency.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>The conduct test requires cost-based reference level values for each resource.</li> <li>Details regarding cost based reference levels may be found in Section 3.13.</li> <li>For the dual-fuel resources, the <i>IESO</i> will establish two sets of above noted applicable reference levels as follows:                             <ul style="list-style-type: none"> <li>Lower-cost fuel, which will be considered the default set of reference levels for ex-ante mitigation, and</li> <li>Higher-cost fuel, which will be used in ex-ante mitigation only if pre-approved by the <i>IESO</i> ahead of DAM/RT market scheduling.</li> </ul> </li> <li>This will result in two sets of reference level values for each of the four applicable parameters listed above. MPM Information System will make both sets of reference level values available to this process (P3).</li> </ul>			
Flow	Source	Target	Frequency
Submitted Dispatch Data and Mitigated Dispatch Data	Scheduling Processes Data Archive	Process P3	Retrieved when process P2 is triggered.
<p><b>Description:</b></p> <ul style="list-style-type: none"> <li><i>Market participant</i> submitted <i>dispatch data</i> and any related mitigated <i>dispatch data</i> (i.e. parameters substituted with the lower reference levels).</li> </ul>			
Flow	Source	Target	Frequency
Dual-Fuel MWP Impact Test Results	Process P3	Market Settlement	Per simulation exercise.
<p><b>Description:</b></p> <p>Results of Dual-Fuel MWP Impact Test include:</p> <ul style="list-style-type: none"> <li>Dual-Fuel MWP Impact Test pass/fail indicator for each MWh that failed the conduct test; and</li> <li>Adjusted (i.e. mitigated) make-whole payments for the MWhs that failed the conduct test.</li> </ul> <p>The Dual-Fuel MWP Impact Test compares make-whole payment using as-submitted <i>dispatch data</i> with make-whole payment calculated using lower reference levels. If the make-whole payment using as-submitted <i>dispatch data</i> exceeds make-whole payment using lower reference levels plus the applicable <i>energy</i> or <i>operating reserve</i> price impact threshold, then the Dual-Fuel MWP Impact Test is deemed to have failed.</p> <p>If for any MWhs that failed the Dual-Fuel MWP Impact Test, then the <i>IESO</i> will apply make-whole payment to the dual fuel resource using the lower reference level. Otherwise, the make-whole payment will be paid using as-submitted <i>dispatch data</i>.</p>			

## 6.12.4 Process P4: Calculate Dual-Fuel Reference Level Settlement Charge

### Description

If dual-fuel conduct test (Process P2) is passed, this process is not performed. For each MWh that failed the dual-fuel conduct test, if the higher reference level is greater than or equal to the LMP at the resource and the LMP at the resource is also greater than or equal to the lower reference level, then the IESO will apply a *settlement charge*<sup>17</sup> described in section 3.13.1.2 in the amount of:

$$\begin{aligned}
 &\textbf{Reference Level Settlement Charge} \\
 &= (\text{MWh that failed the conduct test}) * (\text{LMP} - \text{Lower Reference Level}) \\
 &\quad * P \text{ Multiplier}
 \end{aligned}$$

Where, the LMP is the resource’s LMP from the day-ahead or *real-time market* and the P Multiplier is a persistence multiplier discussed in Section 3.9.2. For MWhs that are scheduled in the day-ahead market, the relevant LMP is the DA LMP. For MWhs that are scheduled in the *real-time market* but not in the day-ahead market, the relevant LMP is the RT LMP.

### Input and Output Data Flows

**Table 6-49: Process P4 Input and Output Data Flows**

Flow	Source	Target	Frequency
DAM/RT Schedules and LMPs	Scheduling Processes Data Archive	Process P4	When the Dual Fuel Conduct Test (Process P2) fails for any MWh  Schedules and LMP are recorded when the dual-fuel resource is scheduled in DAM/RT.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The DAM schedules and LMPs and real time schedules and LMPs of the dual-fuel resource for the period the dual-fuel resource obtained IESO’s pre-approval to use higher-cost fuel and prior to getting DAM/RT schedule.</li> </ul>			
Flow	Source	Target	Frequency
Reference Level Settlement Charge	Process P4	Market Settlement	Once per Determinative Finding.
<b>Description:</b>			
<ul style="list-style-type: none"> <li>The day-ahead base <i>settlement charge</i> for a <i>dispatch day</i> is the sum of <i>settlement charges</i> across all hours of the <i>dispatch day</i> for which the conduct and impact tests was failed.</li> <li>The real-time base <i>settlement charge</i> for a <i>dispatch day</i> is the sum of <i>settlement charges</i> across all intervals of the <i>dispatch day</i> for which the conduct and impact tests was failed.</li> <li>If a resource fails the conduct and impact tests for a <i>dispatch hour</i> in both the day-ahead market and the <i>real-time market</i>, the IESO will determine the day-ahead base <i>settlement charge</i> and the real-time base <i>settlement charge</i> for that <i>dispatch hour</i> and will levy the higher of these two base <i>settlement charges</i>.</li> </ul>			

<sup>17</sup> For calculation and settlements process details, refer to Reference Level Settlement Charge (section 3.13) in the Market Settlement detailed design document.

## 6.13 Internal Process Impacts

A number of internal processes are impacted in order to facilitate the mitigation of market power.

Internal *IESO* processes related to market power mitigation include:

- Authorize Market and Program Participation;
- Record Equipment;
- Plan Operations;
- Submit Market Transactions;
- Direct Short Term Operations; and
- Settle Markets and Programs

Some of the internal processes are related to various *IESO* processes that interact with the Facility Registration process. Some changes to the Facility Registration process under the market renewal program will impact the internal procedures that address these related areas. This may be contingent upon the tools impact of the future day-ahead market and *real-time market*.

Changes or additions to internal *IESO* processes are for internal *IESO* use, and are documented in Appendix C. These updates are not included in the public version of this document.

– End of Section –

# Appendix A: Market Participant Interfaces

The following table provides a high-level description of some of the changes and additions to *IESO* technical interfaces with *market participants* who may be required to support the Market Power Mitigation process design of the future day-ahead market and *real-time market*.

Note: This section reflects a preliminary assessment of the processes and interactions that will be required between the *market participants* and the *IESO* after the implementation of the new market power mitigation framework.

**Table A-1: Impacts to Market Participant Interfaces**

MP Interface Name	Interface Type	Description of Impact
<i>IESO</i> Reports Site and Application Programming Interface (API)	Web Client	<p>New public reports will be introduced related to constrained area designations, uncompetitive <i>inerties</i>, global market power conditions and summarized market power mitigation events.</p> <p>New private reports will be introduced related to resource specific reference levels, reference quantities and market power mitigation events within the calculation and settlement engines.</p>
Online <i>IESO</i>	Web Client	<p>New workflows will be introduced to:</p> <ul style="list-style-type: none"> <li>• Register reference quantities for <i>energy</i> and <i>operating reserve</i> as described in Section 3.14 of this document.</li> <li>• Register reference levels for financial and non-financial <i>dispatch data</i> parameters listed in Section 3.13 of this document.</li> <li>• Allow <i>market participants</i> the opportunity to update fuel costs prior to market scheduling as described in Section 3.13.1.1.</li> <li>• Register dual-fuel treatment of eligible <i>facilities</i> as described in Section 3.13.1.2.</li> <li>• Allow <i>market participants</i> the opportunity to provide supplementary information during physical withholding and economic withholding on uncompetitive <i>inerties</i> investigations as described in Section 3.9 and Section 3.10.</li> </ul>

## **Appendix B: Internal-Facing Procedural Requirements *[Internal only]***

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**This section is confidential to the IESO.**

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## **Appendix C: Business Process and Information Requirements *[Internal only]***

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**This section is confidential to the IESO.**

# References

Document Name	Document ID
MRP High-level Design Single Schedule Market	DES-13
MRP High-level Design Day-Ahead Market	DES-14
MRP High-level Design Enhanced Real-Time Unit Commitment	DES-15
MRP Detailed Design: Overview	DES-16
MRP Detailed Design: Authorization and Participation	DES-17
MRP Detailed Design: Facility Registration	DES-19
MRP Detailed Design: Offers, Bids and Data Inputs	DES-21
MRP Detailed Design: Grid and Market Operations Integration	DES-22
MRP Detailed Design: Day-Ahead Market Calculation Engine	DES-23
MRP Detailed Design: Pre-Dispatch Calculation Engine	DES-24
MRP Detailed Design: Real-Time Calculation Engine	DES-25
MRP Detailed Design: Publishing and Reporting Market Information	DES-27
MRP Detailed Design: Market Settlement	DES-28
Market Manual 2: Market Administration, Part 2.6: Treatment of Compliance Issues	MDP_PRO_0022
Market Manual 2: Market Administration, Part 2.7: Treatment of Surveillance Issues	MDP_PRO_0023
Market Manual 2: Market Administration, Part 2.12: Treatment of Local Market Power	IESO_PRO_0034
Market Manual 1.1 - Participant Authorization, Maintenance & Exit Market Entry	MDP_PRO_0014
Market Manual 1.2 - Facility Registration, Maintenance and De-registration	MDP_PRO_0016
Market Manual 2 - Market Administration – Part 2.1 - Dispute Resolution	MDP_PRO_0017
Market Manual 2 - Market Administration Part -2.2 - Exemption Application and Assessment	IMO_PRO_0019
Market Manual 2 - Market Administration Part 2.7 - Treatment of Market Surveillance Issues	MDP_PRO_0023
Market Manual 2 - Market Administration Part 2.12 - Treatment of Local Market Power	IMO_PRO_0034

<b>Document Name</b>	<b>Document ID</b>
Market Manual 2 - Market Administration Part 2.14 - Information Confidentiality Catalogue	IMO_CAT_0002
Market Manual 4 Market Operations, Part 4.2 - Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets	MDP_PRO_0027
Market Manual 4 Market Operations, Part 4.3 - Real Time Scheduling of the Physical Markets	IMP_PRO_0034
Market Manual 4 Market Operations, Part 4.6 - Real-Time Generation Cost Guarantee Program	PRO-324
Market Manual 5 Settlements, Part 5.5 - Physical Markets Settlement Statements	MDP_PRO_0033
Market Manual 7 System Operations, Part 7.1 - IESO-Controlled Grid Operating Procedures	MDP_PRO_0040
Market Manual 7 System Operations, Part 7.4 - IESO-Controlled Grid Operating Policies	IMP_POL_0002
Market Manual 7 System Operations, Part 7.6 - Glossary of Standard Operating Terms	IMP_GOT_0002
Market Manual 9 Day-Ahead Commitment, Part 9.0 - DACP Overview	IESO_MAN_0041
Market Manual 9 Day-Ahead Commitment, Part 9.1 - Submitting Registration Data for the DACP	IESO_MAN_0076
Market Manual 9 Day-Ahead Commitment, Part 9.2 - Submitting Operational and Market Data for the DACP	IESO_MAN_0077
Market Manual 9 Day-Ahead Commitment, Part 9.3 - Operation of the DACP	IESO_MAN_0078
Market Manual 9 Day-Ahead Commitment, Part 9.4 - Real-Time Integration of the DACP	IESO_MAN_0079
Market Manual 9 Day-Ahead Commitment, Part 9.5 - Settlement of the DACP	IESO_MAN_0080
Market Manual 12 Capacity Auctions, Part 12.0 - Demand Response Auction	MAN-44
Market Rules: Chapter 3, Section 3: Surveillance	MDP_RUL_0002
Market Rules: Chapter 3, Section 6: Compliance	MDP_RUL_0002
Market Rules Chapter 7	MDP_RUL_0002
Market Rules Chapter 7, Appendix 7.6	MDP_RUL_0002
Market Rules Chapter 9	MDP_RUL_0002

– End of Document –