

Detailed Design

Market Renewal Program: Energy Prudential Security

Detailed Design

Issue 2.0

This document provides a detailed overview of the processes related to Prudential Security 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.	November 28, 2019
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Related Documents

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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 <i>Security</i>
DES-19	MRP Detailed Design: <i>Facility</i> Registration
DES-20	MRP Detailed Design: <i>Revenue Meter</i> Registration
DES-21	MRP Detailed Design: <i>Offers, Bids</i> and Data Inputs
DES-22	MRP Detailed Design: Grid and <i>Market Operations</i> Integration
DES-23	MRP Detailed Design: Day-Ahead Market Calculation Engine
DES-24	MRP Detailed Design: Pre- <i>Dispatch</i> 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 Settlements
DES-29	MRP Detailed Design: Market Billing and Funds Administration

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Table of Changes

This detailed design document has been updated since version 1. For more detailed information about these changes, refer to the “MRP Energy Detailed Design - Version 2.0 Updates” document.

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 Prudential Security 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.

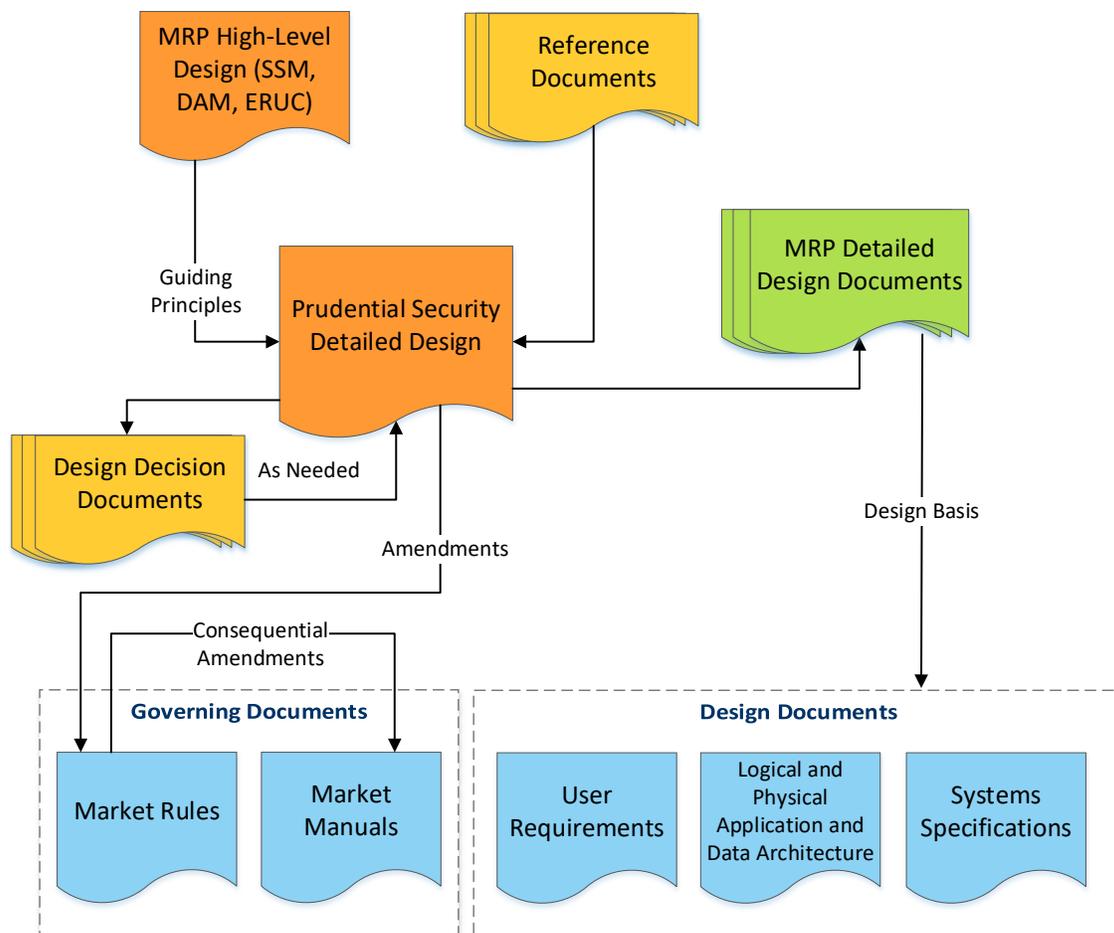


Figure 1-1: Detailed Design Document Relationships

1.2. Scope

This document describes the Prudential Security 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 Prudential Security. However, this document is not a restatement of the existing design of the *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 makes references to specific parameters that might be used in the Prudential Security process, this document may not determine what the value of all those parameters might ultimately be. The 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 is organized as follows:

- **Section 2** of this document briefly describes the current context of the *IESO* Prudential Security process, and its future context for the future day-ahead market and *real-time market*;
- **Section 3** of this document provides a detailed description of the future Prudential Security process;
- **Section 4** of this document describes how the Prudential Security 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 Prudential Security 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 Prudential Security process described in Section 3. This section also outlines the logical boundaries and interfaces of the various sub-processes related to the Prudential Security 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

The scope of the Prudential Security process described in this document address the *energy markets* administered by the *IESO* and *market participant* financial exposure in terms of the dollar value of *energy market* transactions and related uplifts and charges. These processes do not apply to the *transmission rights (TR)* market or to the *demand response auction*¹, which are handled through separate deposit processes.

2.1. Prudential Security in Today's Real-Time Market

The primary service the Prudential Security process delivers is the arrangement of financial *security* for all *market participants*. In the *real-time market*, there is no way to recover the physical commodity if the buyer (*market debtors*) of *energy* is unable to pay because the electricity has already been consumed. *Prudential support* posted by *market debtors* gives sellers (*market creditors*) of *energy*, *operating reserve* and other *ancillary services* an assurance of payment. In the event a buyer does not make a required payment, the *IESO* does not assume the debt. Under such circumstances, the *IESO* would impose a *default levy* exposing *non-defaulting market participants* to a prorated share of the amount of the financial default if the defaulting buyer has not posted adequate *prudential support*.

The current Prudential Security process provides a degree of protection to *non-defaulting market participants* from the risk of having to bear the cost of a *market debtor* defaulting on a payment. To provide this degree of protection, the *IESO* requires all *market participants* to post *prudential support*. The amount of *prudential support* required by a *market participant* reflects their *maximum net exposure* less any reductions they may qualify for under a *margin call* or *no margin call option*.

On an ongoing basis, the *actual exposure* for each *market participant* is monitored against their *trading limit* to help verify that each *market participant* has provided enough *prudential support* to cover their trading activity in the *real-time market*. This verification helps minimize the amount by which a *market participant* may exceed their *trading limit*, which in turn helps limit the *default amount* in the event

¹ The *IESO* has replaced the *demand response auction* with a *capacity auction* to enable competition between additional resource types. All references to the *demand response auction* in this document should be read as reference to the *capacity auction*. Conforming changes required to align with the current or future *capacity auction* will be made during implementation via *market rules* and/or *market manuals*.

a *market participant* defaults. In the event the *IESO* is unable to recover any of the *default amount*, a *default levy* is issued to the *non-defaulting market participants*.

The calculation of the *actual exposure* for a *market participant* includes the following dollar amounts:

- Cleared-but-not-settled amount (CNS): this is an estimate of the dollar value of *energy market* transactions calculated during the period between a *dispatch day* and the date on which *settlement amounts* are calculated for the *dispatch day* as part of the *preliminary settlement statement*. This amount includes estimates of *energy*, all classes of *operating reserve* for dispatchable *market participants*, the expected hourly, daily and monthly uplifts and the monthly and quarterly charges or credits.
- Settled-but-not-invoiced amount (SNI): this is the dollar value of *settlement amounts* for *market participants* from their *preliminary settlement statements* and *final settlement statements* for the *billing period* that have not yet been billed. This amount includes all hourly, daily and monthly *settlement amounts*.
- Prepayment: this is the dollar value of voluntary prepayment and *margin call* payment amounts applied to the *market participant's* account.

If the *actual exposure* reaches a certain percentage of the *market participant's trading limit*, the *IESO* will issue a margin warning or a *margin call* as applicable unless the *market participant* chooses the *no margin call option*.

The information collected by the Prudential *Security* process is communicated to other processes and functions both within the *IESO* and externally. The following list describes inter-process information flows:

- Within the *IESO*, the Authorization and Participation process relies on information provided by the Prudential Security process to ensure that the initial *prudential support obligations* are met before the authorization of *market participants* is completed;
- Within the *IESO*, the Market Cash Management sub-process within treasury uses information from the aggregate *prudential support* posted with the *IESO* to arrange for appropriate lines of credit to operate the *IESO* market clearing account;
- Externally, financial institutions providing lines of credit to the *IESO* for the *IESO-administered markets* are provided with financial assurance that any market-based liabilities of *market participants* are covered by an appropriate level of *prudential support*;
- Externally, *market creditors* providing *energy*, *operating reserve* and other *ancillary services* are assured that the *IESO-administered markets* are

properly secured against the possibility of default by one or more *market participants*;

- Externally, *market creditors* and *market debtors* are assured that the *IESO* will only need to rely upon the *market participant default levy* in a very limited set of circumstances; and
- Externally, *market debtors* are provided with warnings and *margin calls* to ensure that their financial exposure to the *real-time market* does not exceed the financial *security* they have provided to the *IESO*.

The Prudential Security also process relies upon various information from other *IESO* processes and *market participants*. The information provided from internal *IESO* processes includes:

- *Ontario Energy Board* rate information;
- *Settlement* data;
- Accounts receivable data;
- Invoicing data; and
- Authorization and Participation process data.

The information provided by *market participants* includes:

- *Bid* and *offer* data;
- *Self-assessed trading limits*;
- Posted *prudential support*; and
- Changes to credit ratings.

The current Prudential Security process supports a number of critical processing functions as illustrated in Figure 2-1. In particular, the following market-facing processes are described in the *market manual* that governs *prudential support*:

- the initial assessment of the *prudential support obligation* for an *applicant* wishing to be authorized as a *market participant*, based on their estimated trading activity in the *real-time market*;
- the regular review of a *market participant's trading limit* by the *market participant* (with the exception of *market participants* under the *no margin call option*);
- the regular review of a *market participant's trading limit, default protection amount (DPA)* and *prudential support obligation* by the *IESO* prior to the start of a new *billing period* as applicable;

- the daily monitoring of the *actual exposure* of a *market participant* in the *real-time market* against their *trading limit* by the *IESO* (with the exception of *market participants* under the *no margin call option*); and
- the posting of *prudential support* by *market participants* to meet their current *prudential support obligation*.

All the activities of the Prudential *Security* process are supported within the legal framework of the *market rules* and the *participation agreement* that binds each *market participant* to the *market rules*. These *market rules* requirements will be discussed within Section 4 of this document.

The Prudential *Security* process is also supported by a set of market-facing manuals and internal procedures. The related requirements for these market-facing manuals and internal procedures are further discussed in Section 5 of this document.

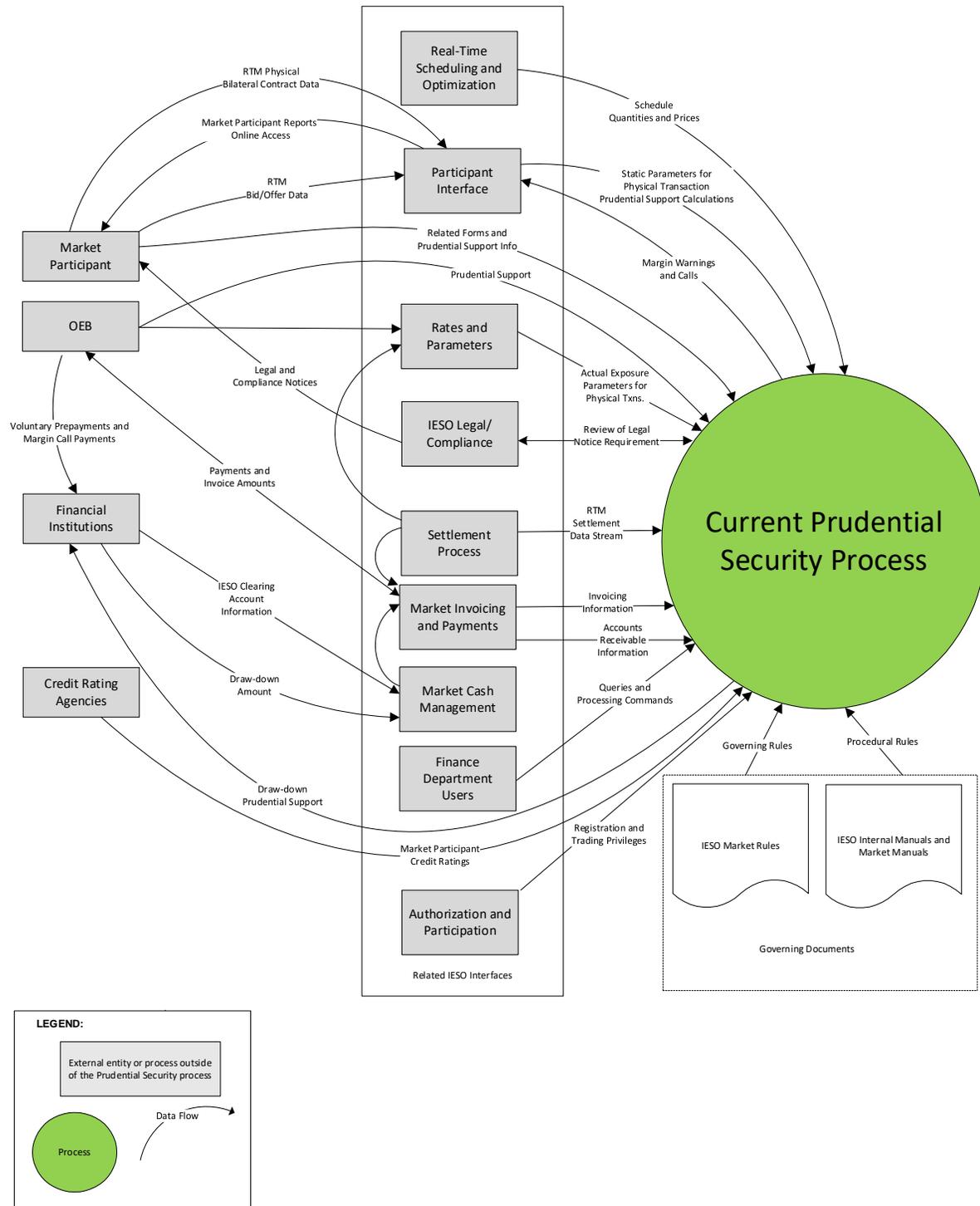


Figure 2-1: Current Prudential Security Process

2.2. Prudential Security in the Future Day-Ahead Market and Real-Time Market

The design of the future *real-time market* and the introduction of the day-ahead market and virtual transactions will necessitate changes to the Prudential Security process. The design approach is to maintain the existing Prudential Security process for physical transactions and use the foundation of this existing process for virtual transactions to the extent possible. In terms of information flow, the majority of the changes do not fundamentally change the nature of the key interfaces between the Prudential Security process and other *IESO* processes or between the Prudential Security process and *market participants*. This document discusses changes to the existing procedures, processes, rules and interfaces as they relate separately to physical and virtual transactions. The *prudential support obligations* for physical transactions will cover both day-ahead market and *real-time market* activity.

In the future day-ahead market, when a *bid* or *offer* is designated as being physical or virtual, the prudential treatment of the transaction will differ in a number of ways as it progresses from the initiation of the *bid* or *offer* through to the *settlement* phase. Some of the key differences over the transaction lifecycle include the following:

- *prudential support obligations* will be assessed separately for physical and virtual transactions;
- on a continuous basis, virtual transaction *bids* and *offers* will be screened against a virtual transaction *trading limit* (in dollars) established by the *IESO* and an absolute value of the maximum daily *trading limit* (in MWh) provided by the *market participant*;
- physical transactions and virtual transactions *actual exposure* will be calculated separately as they accrue through the various stages of the daily financial exposure calculation; and
- virtual transaction trading activities will be temporarily disabled for a *market participant* should their *actual exposure* reach 100% of their *trading limit*.

There are also areas where the prudential treatment for physical transactions and virtual transactions will cross paths. Some of these include:

- the consolidated *actual exposure* for a *market participant's* physical and virtual transactions will be compared against their consolidated *trading limit* (in dollars) for physical and virtual transactions;
- *margin calls* for physical transactions and virtual transactions will be issued for overruns in regards to their consolidated *trading limit* (in dollars);

- prepayments (voluntary and *margin call* payments) will be applied as one to reduce the consolidated *actual exposure* levels for physical transactions and virtual transactions;
- prepayments (voluntary and *margin call* payments) made after the issuance of the previous month's *invoice* and up to one *business day* prior to the issuance of the current month's *invoice* will reduce the combined *actual exposure* for both physical transactions and virtual transactions; and
- one *default levy* will be issued for *default amounts* that result from either physical transaction or virtual transaction trading activities, or both.

The treatment of physical transactions and virtual transactions that may not cross will be the forms of *prudential support*. An irrevocable letter of credit will be the only acceptable form for posting *prudential support* for virtual transactions. Existing *market participants* that have posted another form of *prudential support* for their physical transactions will need to additionally provide an irrevocable letter of credit to satisfy their *prudential support obligation* for virtual transactions. However, existing *market participants* that have already posted an irrevocable letter of credit for their physical transactions can choose to utilize this form to satisfy their *prudential support obligation* for virtual transactions. New *market participants* who choose to participate in both physical and virtual transactions at the time of registration will have the option to satisfy their *prudential support obligation* for both physical and virtual transactions by using an irrevocable letter of credit. The forms of *prudential support* are discussed in detail in Sections 3.5.3 and 3.6.3.

2.2.1. New or Modified Input Flows into the Prudential Process

The new or modified input flows required for the future day-ahead market and *real-time market* are summarized below and illustrated in Figure 2–2.

- *Prudential support*: With the introduction of virtual transactions, the *prudential support obligation* will be calculated separately, but *prudential support* may be posted jointly or separately for physical transactions and virtual transactions depending on the form of *prudential support* provided by the *market participant*;
- *Market participant* Interfaces: The scope of information provided through the *market participant* interfaces will be supplemented with additional information about intended day-ahead market activity for physical transactions and virtual transactions;
- *Settlement* data stream: This data stream will now include *settlement amounts* related to *real-time market* activity and day-ahead market activity for physical transactions and virtual transactions;

- Governing rules: The *market rules* will define the necessary obligations from a prudential perspective of both *market participants* and the *IESO* itself as required to govern the day-ahead market process;
- Procedural rules: As with today's Prudential *Security* process, a series of external *market manuals* and internal manuals will govern the procedural steps to be carried out by *market participants* and the *IESO*; and
- Data from the DAM calculation engine: The Prudential *Security* process will require information from the DAM calculation engine in a manner consistent with the data stream required from the real-time (RT) calculation engine. This will be used to calculate the cleared-but-not-settled portion of *actual exposure* for both virtual transactions and physical transactions.

The above changes are highlighted in terms of affected information flow in Figure 2–2 and will be further described in Sections 3 and 6 of this document.

2.2.2. New or Modified Outputs from the Prudential Process

The new or modified outputs required for the future day-ahead market and *real-time market* are discussed below and illustrated in Figure 2–2.

- *Margin Calls* and Warnings: A *market participant* solely engaging in virtual transactions will receive *margin calls* and warnings similar to *market participants* solely engaging in physical transactions. A single *margin call* or warning will be issued to *market participants* engaging in both virtual transactions and physical transactions.
- Day-Ahead Market *Bid/Offer* Limits: The Prudential Security process will now provide information to the *Energy Market Interface* regarding the maximum megawatt hours and *trading limit* in dollars that a *market participant* can transact through virtual transactions on a given day.
- *Prudential Support* Confirmation: The Prudential Security process will provide additional information to the Authorization and Participation process, confirming that a *market participant* has met any necessary *prudential support obligations* for both physical transactions and virtual transactions. This information will periodically need to be updated in the event that either or both types of trading privileges need to be suspended, revoked or reinstated.
- Day-ahead market to *real-time market price* deltas: With the separate determination of a *prudential support obligation* for virtual transactions, the Prudential Security process will provide price deltas to allow *market participants* to assess the cost impact of the *prudential support obligation* for virtual trading and estimate the daily exposure in dollars based on their submitted virtual *bids* and *offers*.

The above changes are highlighted in terms of affected information flow in Figure 2-2 and will be further described in Section 3 of this document.

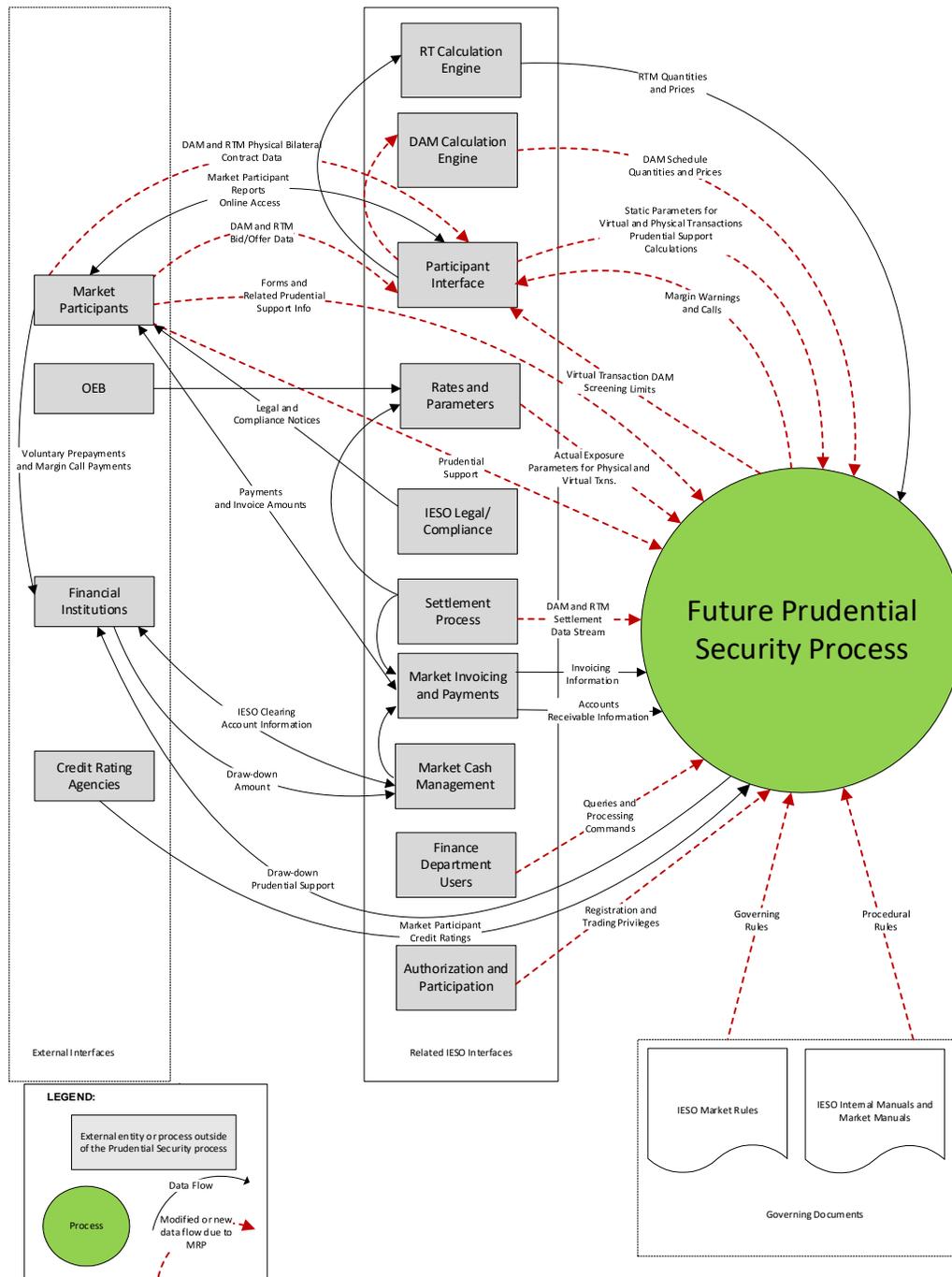


Figure 2-2: Future Prudential Security Process

– End of Section –

3. Detailed Functional Design

3.1. Structure of this Section

The design of the Prudential Security process in the future day-ahead market and *real-time market* will be described in terms of:

- Objectives
- Physical Versus Virtual Risk Characteristics
- Collection of Registration Information
- Physical Transactions:
 - Overview
 - Prudential Support Obligations for Physical Transactions
 - Forms of Physical Transaction Prudential Support
 - Data Input Requirements for Physical Transaction Prudential Support Obligations
 - Monitoring Actual Exposure for Physical Transactions
 - Data Input Requirements for Physical Transaction Monitoring of Actual Exposure
 - Margin Warnings and Margin Calls for Physical Transactions
- Virtual Transactions:
 - Overview
 - Prudential Support Obligation for Virtual Transactions
 - Forms of Virtual Transaction Prudential Support
 - Data Input Requirements for Virtual Transaction Prudential Support Obligation
 - Monitoring Actual Exposure and Screening for Virtual Transactions
 - Data Input Requirements for Monitoring Virtual Transaction Actual Exposure
 - Margin Warnings and Margin Calls for Virtual Transactions
 - Publication of Day-Ahead to Real-Time Price Delta
- Consolidated Processes:

- Consolidated Actual Exposure Monitoring for Physical and Virtual Transactions
- Prepayment and Invoicing
- Default Levy

3.2. Objectives

The Prudential Security process will continue to provide cost-effective credit risk mitigation for the *IESO's* wholesale electricity market. The two main objectives for the Prudential Security process in the future day-ahead market and *real-time market* are to:

- Mitigate financial risk to protect the *IESO* and *market participants* from payment defaults; and
- Minimize the administrative impact of changing the current process.

To this end, the Prudential Security detailed design identifies the changes required to support the future day-ahead market and *real-time market* while addressing the following design considerations:

- Risk management – the design should provide cost-effective credit risk mitigation for the *IESO's* wholesale electricity market to balance (i) fairness to all *market participants*, (ii) the overall estimated cost to *market participants* of providing collateral and (iii) the estimated costs and risk of payment of *default levies*; and
- Simplicity – the design should utilize a construct that works within the current *real-time market* prudential construct to minimize both the change impact on current systems and administrative costs, while continuing to support an acceptable level of risk management.

The Prudential Security process design has been developed in the context of the future day-ahead market and *real-time market* that will support both physical transactions and virtual transactions. Descriptions of these two transaction types are as follows:

- **Physical transaction:** A purchase or sale of *energy* or the sale of class r *operating reserve* in the day-ahead market coupled with the consumption or delivery of a quantity of the corresponding *energy* or selling of class r *operating reserve* in the *real-time market* during the corresponding real-time *settlement hour*; and
- **Virtual transaction:** A purchase or sale of *energy* in the day-ahead market with no subsequent consumption or delivery of *energy* in the *real-time market* during the corresponding real-time *settlement hour*.

In the future day-ahead market, a *market participant* will designate *offer* or *bid* submissions as being either physical or virtual. *Settlement amounts* for the day-ahead market and the *real-time market* will be calculated for both types of transactions by the *settlement process* and these *settlement amounts* will be provided to the Prudential Security process.

The Prudential Security process design for the future *energy markets* does not apply to the *Transmission Rights (TR)* market or to the *demand response auction*. These *IESO-administered markets* are handled through separate deposit processes and will not be discussed in this document.

3.3. Physical Versus Virtual Risk Characteristics

A *market participant* submitting *bid* or *offer* quantities in the day-ahead market for physical transactions is naturally bounded by the physical capacity of the underlying *facility*. In contrast, a *market participant* submitting *bid* or *offer* quantities for virtual transactions is not bounded by any physical capacity and can therefore purchase or sell larger quantities of *energy* compared to physical transactions. The risk comes from the potential for *market participants* to submit virtual transactions at higher quantities, coupled with the potential of being exposed to unexpected price increases from the day-ahead market to the *real-time market* and no ability to actually consume or produce *energy* in the *real-time market*. Should the *market participant* experience a large loss they are unable to cover, the default will introduce more risk to the market through the *default levy*. This increased risk requires separate treatment of physical and virtual transactions within the Prudential Security process for *settlement* and risk management purposes.

Certain aspects of the Prudential Security process will not require separation of physical transactions and virtual transactions. This consolidation will occur when a *market participant* is authorized to engage in both virtual and physical transactions. In these cases, the risk of both physical transaction and virtual transaction default will be combined and the *IESO* will monitor the consolidated *actual exposure* against the consolidated *trading limit* between the two types of transactions.

3.4. Collection of Registration Information

The Authorization and Participation process will continue to exchange information about a *market participant's* trading privileges for physical transactions with the Prudential Security process. This exchange will be updated to include information about a *market participant's* trading privileges for virtual transactions. Such information will include:

1. Notification that a *market participant* is seeking to be authorized to engage in physical transactions as a:

- *metered market participant* for a *generation facility* or *load facility* in the day-ahead market and *real-time market*; or
- *market participant* for a *boundary entity* in the day-ahead market and *real-time market*.

This information will be used as a trigger for the Prudential Security process to determine the amount of *prudential support* the *market participant* is required to provide in order to complete the Authorization and Participation process for physical transactions.

2. Notification that a *market participant* is seeking to be authorized to engage in virtual transactions. This information will be used as a trigger for the Prudential Security process to determine the amount of *prudential support* the *market participant* is required to provide in order to complete the Authorization and Participation process for virtual transactions.
3. Confirmation that the *market participant* has provided adequate initial *prudential support* to engage in physical transactions and/or virtual transactions. This information will be used as an input to the Authorization and Participation process so that the *market participant* can be authorized to engage in physical and/or virtual transactions once all other aspects of the Authorization and Participation process are completed.

Refer to the Authorization and Participation detailed design document for additional information.

3.5. Physical Transactions

Note to the Reader: Within the existing *Prudential Support market manual* there is an overlap in the usage of the terms "*metered market participant*", "*dispatchable market participant*" and "*non-dispatchable market participant*" with the "*metered market participant*" role spanning the notions of "*dispatchable market participant*" and "*non-dispatchable market participant*". The *market manual* indicates that the determination of the *prudential support obligation* is further delineated for "*metered participants*" and "*non-metered participants*". In practice, "*metered participants*" include both local distribution companies (LDC) and all other *non-dispatchable loads*, and "*non-metered participants*" encompass *market participants* engaging in physical transactions occurring at the *interties*.

For the purpose of this document, "*metered participants*" will refer to *market participants* who are the *metered market participant* for *non-dispatchable loads*, and "*non-metered participant*" will refer to *market participants* authorized to import or export *energy* or *operating reserve* at the *interties*.

The categories of "*dispatchable market participant*" and "*non-dispatchable market participant*" is utilized in the calculation of the CNS component of *actual exposure*

discussed later in this document. “Dispatchable market participants” means the *metered market participant* for *dispatchable loads*, *dispatchable generation facilities*, and *market participants* authorized for import and export transactions. “Non-dispatchable market participant” means the *metered market participant* for *non-dispatchable loads* including LDCs.

3.5.1. Overview

The Prudential Security process for physical transactions in the future day-ahead market and *real-time market* will be similar to the Prudential Security process for the existing *real-time market* because physical transactions scheduled in the day-ahead market will be coupled with a financial obligation to consume or deliver the corresponding *energy* or *operating reserve* commodity in the real-time *dispatch hour*. This financial obligation will provide the *IESO* and *market participants* with an expectation for actual consumption or delivery in the real-time *dispatch hour*.

The following sections describe how the prudential requirements for physical transactions in the existing *real-time market* will be modified to account for the future day-ahead market.

3.5.2. Prudential Support Obligations for Physical Transactions

Prudential support obligations for physical transactions in the future day-ahead market will be integrated with the existing process for assessing *prudential support obligations* in the *real-time market*.

“Metered participants” and “non-metered participants” will continue to be able to request the *IESO* determine their *prudential support obligations* differently under a *margin call* or *no margin call option*. Under a *margin call* or *no margin call option*, *prudential support obligations* for “metered participants” and “non-metered participants” will cover day-ahead market and *real-time market* activity. Under a *margin call* option, *prudential support obligations* for *market participants* will continue to consist of the following four activities:

1. *Minimum trading limit* estimate – this is the *IESO’s* assessment of a *minimum trading limit* for “metered participants” and “non-metered participants” covering day-ahead market and *real-time market* activity.
2. Establishment of a *default protection amount* – this is the *IESO’s* assessment of a *default protection amount* for “metered participants” and “non-metered participants” covering day-ahead market and *real-time market* activity.
3. Establishment of *maximum net exposure* – in accordance with Chapter 2, Section 5.3 of the *market rules*, this will cover day-ahead market and *real-time market* activity and is determined by adding the greater of the *self-assessed trading limit* submitted by the *market participant* or the *IESO-determined minimum trading limit* to the *default protection amount*.

4. Allowable reductions – applying any reductions to the *maximum net exposure* that are allowable under Chapter 2, Section 5.8 of the *market rules* for good payment history, credit rating, or in the case of *distributors*, prudential credit obtained under the *OEB Retail Settlement Code*.

The physical transaction *prudential support obligation* under a *margin call* option will continue to be the sum of the greater of the *self-assessed trading limit* submitted by the *market participant* or the *IESO*-determined *minimum trading limit*, and the *IESO* determined *default protection amount*, less allowable reductions.

Under a *no margin call option*, the *prudential support obligation* for “metered participants” will continue to consist of the following two activities:

1. Establishment of *maximum net exposure* – in accordance with Chapter 2, Section 5.6 of the *market rules*, this is determined based on 70 days of day-ahead market and *real-time market* activity.
2. Allowable reductions - in accordance with Chapter 2, Section 5.6 of the *market rules*, no reductions are allowed based on good payment history and credit rating under a *no margin call option*. One exception for allowable reductions in accordance with Chapter 2, Section 5.6 of the *market rules* is for *small distributors* who are eligible to reduce their *prudential support obligation* by an amount equal to 60% of the *distributor’s* collection of *prudential support*.

The physical transaction *prudential support obligation* under a *no margin call option* will continue to be the *maximum net exposure* based on 70 days of market activity. The market activity will now include both day-ahead market and *real-time market* activity as opposed to only *real-time market* activity. There will continue to be no allowable reductions except for *small distributors*.

In the sub-sections that follow, the calculation of prudential requirements for physical transactions in the future day-ahead market and *real-time market* will be described in terms of each of the four activities listed above under the *margin call* option.

Minimum Trading Limit Estimate

Minimum trading limit estimates for “metered participants” and “non-metered participants” will continue to be based on expected activity within the *IESO-administered markets*. With the introduction of a day-ahead market, the quality of these estimates will now be affected by:

- The extent to which the actual real-time *energy* flows for each “metered participant” and “non-metered participant” deviate from their day-ahead market schedules; and

- The extent to which the day-ahead market and *real-time market prices* applicable to each “metered participant” or “non-metered participant” actually converge.

“Metered Participants”

Under a *no margin call option*, the *minimum trading limit* estimate for “metered participants” will continue to be based on 49 days of *real-time market* activity.

Under a *margin call option*, the *IESO*-determined *minimum trading limit* for “metered participants” will continue to be based on the following two components:

- First component - the estimated quantity of physical *energy* withdrawn from the *real-time market* will continue to be based on 7 to 49 days of expected *energy* withdrawals; and
- Second component - a series of rate estimates used to approximate a level of *actual exposure* based on the estimated quantity of physical *energy* withdrawn from the *real-time market*.

The first component will be updated to account for the risk that expected *energy* withdrawals from the *real-time market* may deviate from the expected *energy* withdrawals scheduled in the day-ahead market. The *IESO* will address this risk, as required, by using more than the minimum of 7 days of estimated *energy* withdrawals, up to a maximum of 49 days, in accordance with Chapter 2, Section 5.3.4 of the *market rules*.

The second component will be updated to account for the risk that day-ahead prices and *real-time energy* prices may not actually converge. The *IESO* will address this risk, as required, through its authority to adjust these prices under the current *market rules*. Table 3-1 details the rate estimates for the *settlement amounts* that will be included in the calculation of the second component.

Table 3-1: Impact on Rate Estimates

Settlement Amount	Impact on Rate Estimates
<i>Energy</i>	<p>The price for <i>energy</i> estimate will no longer be based on the <i>Ontario Energy Board's</i> (OEB's) price forecasts under the regulated price plan (RPP). Depending on the <i>facility</i> type the <i>market participants</i> are associated with, the <i>IESO</i> will use the following prices for <i>energy</i> estimates:</p> <ul style="list-style-type: none"> • For <i>metered market participants</i> representing <i>generation facilities, dispatchable loads</i> and price responsive loads, the <i>IESO</i> will use the higher of the average locational marginal

Settlement Amount	Impact on Rate Estimates
	<p>price (LMP) in the day-ahead market or the average LMP in the <i>real-time market</i>.</p> <ul style="list-style-type: none"> For <i>metered market participants</i> associated with <i>non-dispatchable loads</i>, the <i>IESO</i> will use the higher of the average Ontario zonal price in the day-ahead market or the average Ontario zonal price in the <i>real-time market</i>.
Global Adjustment	No change. Class A and Class B global adjustment will continue to be estimated as it is done in the current market.
<i>Physical Bilateral Contract</i> Adjustment (could be used as form of reduction)	<p>No change.</p> <p>Note: The <i>physical bilateral contract</i> adjustment amount will continue to be available to a <i>metered market participant</i> with a credit rating of BBB- or higher under certain circumstances as specified in Chapter 2, Section 5.3.8A of the <i>market rules</i>.</p>
Transmission Tariff Rates (Network, Line Connection, Transformation Connection, Export)	No change.
Uplift and Ancillary Charges	<ul style="list-style-type: none"> The <i>IESO</i> currently uses the \$/MW daily, monthly and quarterly uplifts from Section 7 of the monthly market report to calculate the estimated aggregated uplift and ancillary charge rate. In the future day-ahead market and <i>real-time market</i>, the <i>IESO</i> will continue to update this rate if the monthly market report indicates a rate change of 15% or more from the most recent report. Any new day-ahead market uplifts and new or modified <i>real-time market</i> uplifts will be included in the <i>IESO's</i> estimated uplift and ancillary charge rate. Refer to the Market <i>Settlement</i> detailed design document for more information.
<i>IESO Administration Charge</i>	No change.
Rural or Remote Rate Protection	No change.

“Non-Metered Participants”

Under a *no margin call option*, there will continue to be no need for the *IESO* to establish a *minimum trading limit* for “non-metered participants”.

Under a *margin call option*, the *minimum trading limit* estimate for a “non-metered participant” will continue to be based on:

- 25% of the *market participant's* expected *settlement amounts* based on their invoices over the past three *energy market billing periods*; or
- if invoices for three months are not available, 25% of the *market participant's* expected *settlement amounts* for the upcoming *energy market billing period*.

Establishment of a Default Protection Amount

The *IESO's* establishment of a *default protection amount* will be identical to the process used for the current *real-time market*. The *default protection amount* calculation will continue to be different for “metered participants” and “non-metered participants”. For “metered participants”, 21 days of market activity will continue to be used but will now cover day-ahead market activity in addition to *real-time market* activity.

For “non-metered participants”, the *default protection amount* will continue to be equal to the *minimum trading limit* calculated by the *IESO*.

Establishment of Maximum Net Exposure

For both “metered participants” and “non-metered participants” conducting physical transactions under a *margin call option*, *maximum net exposure* will continue to be the sum of the *default protection amount* and the greater of the *IESO-determined minimum trading limit* or the *self-assessed trading limit* provided by the *market participant*. The *maximum net exposure* will now cover day-ahead market activity in addition to *real-time market* activity.

Under a *no margin call option* for “metered participants”, *maximum net exposure* will continue to be the sum of the *IESO-determined minimum trading limit* and the *IESO-determined default protection amount*. The *IESO-determined trading limit* currently based on 49 days of *real-time market* activity will be updated to include day-ahead market activity. The *IESO-determined default protection amount* currently based on 21 days of *real-time market activity* will be updated to include day-ahead market activity.

Under the *no margin call option* for “non-metered participants”, *maximum net exposure* will continue to be based on 100% of estimated net *settlement amounts* for the upcoming *billing period*.

Minimum Prudential Support Requirements for “Non-Metered Participants”

“Non-metered participants” authorized to participate in the future *energy* market solely to import *energy* or *operating reserve* at *boundary entities* without any prior history of engaging in physical transactions in the future day-ahead market and *real-time market* will have an obligation to provide a minimum amount of *prudential support* even if they expect to transact as a net creditor. The *IESO* will require each “non-metered participant” to provide the greater of the following as *prudential support*:

- A *minimum trading limit* equal to 25% of the absolute value of the *market participant’s* expected *settlement amounts* for the upcoming *energy market billing period* plus a *default protection amount* equal to 25% of the absolute value of the *market participant’s* expected *settlement amounts* for the upcoming *energy market billing period*; or
- \$50,000, with 50% of this amount used as the *minimum trading limit* and 50% used as the *default protection amount*.

A “non-metered participant” may qualify to have this minimum *prudential support obligation* reduced in accordance with the allowable reductions for physical transactions described in the next subsection, Allowable Reductions.

Allowable Reductions

The allowable reductions in *prudential support* for physical transactions will remain the same as currently allowed under Chapter 2, Section 5.8 of the *market rules*, which include reductions for *market participant’s* credit ratings, the *market participant’s* good payment history for the purchase of electricity in Ontario, and the LDC prudential credit.

In the absence of any allowable reductions, “metered participants” and “non-metered participants” engaging in physical transactions will continue to be required to provide *prudential support* that is equivalent to their *maximum net exposure* calculation.

IESO Reassessment of Prudential Support Obligation

The process of re-assessing a *market participant’s* physical transaction *prudential support obligation* may be triggered for the same reasons that are present in the current *real-time market* including, but not limited to:

- exceeding a *trading limit*;
- a material change in the credit status of a *market participant*;

- an adjustment to a *market participant's minimum trading limit* as a result of issuing one or more *margin calls* over the course of a *billing period*; or
- when the *IESO* has adjusted its price basis for "metered participants".

In all such cases, both "metered participants" and "non-metered participants" must respond by providing additional *prudential support* as per the existing *market rules*. In the event a *market participant* fails to provide and maintain *prudential support* within the required time period, the *IESO* will continue to treat this as an *event of default*.

3.5.3. Forms of Physical Transaction Prudential Support

All forms of *prudential support* available under the current *real-time market* for physical transactions will be available to satisfy *prudential support obligation* for physical transactions in the future day-ahead market and *real-time market*. Accepted forms of *prudential support* will continue to include the following collateral types:

- An irrevocable commercial letter of credit;
- A third-party guarantee;
- Marketable securities in the form of Canadian government treasury bills; and
- An *affiliate* guarantee.

3.5.4. Data Input Requirements for Physical Transaction Prudential Support Obligations

The establishment of *prudential support obligations* for physical transactions will continue to be initialized and then maintained through the collection of data inputs from *market participants* and other institutions such as banks and credit rating agencies. This data may be revised periodically based on *IESO* assessments or based on changes provided by *market participants*.

Prudential support initialization data for the *real-time market* is currently collected through Online *IESO*, which will continue to be used to support the Prudential Security process in the future day-ahead market and *real-time market*. Table 3-2 summarizes the different data inputs and the sources used to establish the *prudential support obligations* for physical transactions.

Table 3-2: Data Inputs that Support Prudential Support Obligations for Physical Transactions

Data Source	Input Data	Type	Usage within the Prudential Security process to establish prudential support obligations
Online <i>IESO</i> (Authorization and Participation Module)	General information	Modified	<ul style="list-style-type: none"> • With the introduction of the future markets, the information collected will have to be further sub-divided between information pertaining to physical transactions and virtual transactions. • This information will be used to determine the <i>prudential support obligation</i>.
	Estimated maximum daily MWh	Existing	<ul style="list-style-type: none"> • Provided by “metered participants” - expected daily maximum <i>energy</i> injections and withdrawals. • Used to support the “metered participant” <i>maximum net exposure</i> calculation by the <i>IESO</i>.
	<i>Self-assessed trading limit</i> (in dollars)	Existing	<ul style="list-style-type: none"> • Provided by “metered participants” and used in their <i>maximum net exposure</i> calculation if greater than the <i>IESO</i>-determined <i>trading limit</i>
Market Invoicing and Payments (<i>IESO</i> Finance system)	Estimated net <i>settlement amounts</i> of last three invoices	Existing	<ul style="list-style-type: none"> • The <i>IESO</i>-determined <i>maximum net exposure</i> for “non-metered participants” based on three months’ worth of recent market activity, if available.
Online <i>IESO</i> (Authorization and Participation Module)	Forecast of future market activity	Existing	<ul style="list-style-type: none"> • Provided by “non-metered participants”. • <i>IESO</i>-determined <i>maximum net exposure</i> for “non-metered participants” set using <i>market participant</i>-provided forecast of future market activity if no recent three month activity within the day-ahead market and <i>real time market</i>.

Data Source	Input Data	Type	Usage within the Prudential Security process to establish prudential support obligations
Online <i>IESO</i> (Authorization and Participation Module)	<i>Self-assessed trading limit</i> (in dollars)	Existing	<ul style="list-style-type: none"> • Provided by “non-metered participants” based on expected <i>settlement amounts</i> for the upcoming <i>billing period</i> and used in their <i>maximum net exposure</i> calculation.
Online <i>IESO</i> (Authorization and Participation Module)	Credit information	Existing	<ul style="list-style-type: none"> • Credit ratings from an <i>IESO</i>-approved major bond rating agency for “metered participants” and “non-metered participants” will continue to be collected to determine the allowable reduction to a <i>market participant’s prudential support obligation</i>. • The <i>IESO</i> will continue to use either a credit rating or good payment history - but not both - to reduce a <i>market participant’s prudential support obligation</i>. Credit ratings will continue to supersede good payment history reductions.
Market Billing (<i>IESO</i> Finance system)	Good payment history	Existing	<ul style="list-style-type: none"> • Good payment history in the <i>IESO-administered markets</i> for “metered participants” and “non-metered participants” will continue to be used as a way of reducing their <i>prudential support obligation</i> should they qualify. • The <i>IESO</i> will continue to use one of credit rating or good payment history - but not both to reduce a <i>market participant’s prudential support obligation</i>. Credit ratings will continue to supersede good payment history reductions.

The impact of these data inputs to various *market participant* interfaces used to support the Prudential Security process are described in Appendix A: Market Participant Interfaces.

3.5.5. Monitoring Actual Exposure for Physical Transactions

Daily monitoring of *actual exposure* for physical transactions (AE-P) in the future day-ahead market and *real-time market* will be integrated with the current daily monitoring of *actual exposure* in the *real-time market*. For example, margin warnings and *margin calls* will be issued based on the aggregate *actual exposure* of the physical transactions in the day-ahead market and *real-time market*. As a result, the following components of the current *actual exposure* calculation will be affected:

- The cleared-but-not-settled (CNS) component calculation will be updated to estimate a *market participant's* net *settlement* between the day-ahead market and the *real-time market* for *energy* and where applicable, all classes of *operating reserve*. It will also now include day-ahead market uplift amounts and any new *real-time market* uplift amounts. Subsequent sections will describe how this calculation will vary for each class of *market participant*.
 - Other *settlement amounts* portion of CNS - any new non-hourly or non-daily *settlement amounts* - will be estimated as part of the daily exposure calculation. In addition, the dollar amounts, which have the potential to be duplicated under the settled-but-not-invoiced (SNI) component once the month-end final *settlement statement* is produced, will continue to be extracted from these amounts under the respective line items.
- The SNI component calculation will not change but will now include new and modified *settlement amounts* listed in subsequent sections. It will continue to be the sum of amounts on the *preliminary settlement statements* and *final settlement statements* that have not been invoiced.
- The prepayment component of *actual exposure*, which the *IESO* will include to reduce *actual exposure*. Similarly, the *IESO* will continue to add any prepayment for which a refund has been issued to the *market participant's actual exposure*.

In addition to the above, any *margin calls* issued and outstanding will continue to be carried forward in the *actual exposure* calculation until two *business days* prior to invoicing. Lastly the applicable tax treatment will be applied against amounts within the *actual exposure* calculation. To verify that each *market participant* has provided enough *prudential support* to cover their physical trading activities in the future day-ahead market and *real-time market*, AE-P will continue to be monitored by comparing a *market participant's actual exposure* to the *IESO*-established *trading limit*.

CNS Component for Physical Transactions

The CNS component will continue to be calculated differently between various classes of *market participants*. The two classes of *market participants* are “dispatchable market participants” and “non-dispatchable market participants”.

“Dispatchable market participants” are *market participants* with financial obligations for market transactions arising from the supply or consumption of *energy* or *operating reserve* for:

- Dispatchable *generation facilities*;
- *Dispatchable loads*; and
- *Boundary entity* import and export transactions.

Price responsive loads are subject to the same two-*settlement process* as “dispatchable market participants” and therefore, will be included in the class of “dispatchable market participants” for the purposes of CNS component calculations.

“Non-dispatchable *market participants*” are *market participants* with financial obligations for market transactions arising from the consumption of *energy* for *non-dispatchable loads* including LDCs.

Updates required to the CNS component for each class are as follows:

Dispatchable Market Participants

The CNS component will be updated to include the physical transaction quantities and LMPs for *energy* and *operating reserve* that have cleared the day-ahead market and have been *dispatched* in real-time but have not yet been incorporated into the *settlement process*. These day-ahead market scheduled quantities and LMPs will be compared against their corresponding allocated quantity of *energy* withdrawn (AQEW) and LMPs for *energy* and *operating reserve* in the *real-time market*.

The CNS component for “dispatchable market participants” will be calculated on a daily basis using the day-ahead market and *real-time market* quantity and prices described above. The following CNS calculation will be used:

$$CNS = \sum_H^M [(QDAM_{k,h^m} \times \$DAM_{k,h^m}) + (QRTM_{k,h^m} - QDAM_{k,h^m}) \times \$RTM_{k,h^m}]$$

Where,

M the set of all metering points

- QDAM* Hourly day-ahead market scheduled quantity of *energy* or *operating reserve* in MWh for *market participant* k at *delivery point* and *intertie metering point* m in *settlement hour* h
- \$DAM* Hourly day-ahead market LMP for *energy* or *operating reserve* in dollars for *market participant* k at *delivery point* and *intertie metering point* m in *settlement hour* h
- QRTM* Hourly *real-time market* allocated quantity of *energy* injected or withdrawn (AQEI or AQEW) or *operating reserve scheduled* in MWh for *market participant* k at *delivery point* and *intertie metering point* m in *settlement hour* h
- \$RTM* Hourly average *real-time market* LMP in dollars for *market participant* k at *delivery point* and *intertie metering point* m in *settlement hour* h

Non-Dispatchable Market Participants

The CNS component for *non-dispatchable loads* will be updated to include the hourly Ontario zonal price cleared in the day-ahead market and the actual quantity of *energy* withdrawn in real-time. The IESO will use the hourly allocated quantity of *energy* withdrawn (AQEW) and the hourly day-ahead Ontario zonal price. The day-ahead Ontario zonal price used for these estimations will not include the forecast deviation price adjustments that will account for the cost or benefit of the day-ahead under-forecast or over-forecast to be calculated by the *settlement process* in the determination of the *energy* price paid by *non-dispatchable loads*.

The CNS component for “non-dispatchable metered participants” will continue to be calculated on a daily basis using the updated variables described above. The following CNS calculation will be used:

$$CNS = \sum_H^M (QRTM_{k,h^m} \times \$DAMOZP_{k,h^m})$$

Where,

- M the set of all *metering points*
- QRTM* Hourly *real-time market* allocated quantity of *energy* withdrawn (AQEW) in MWh for;
- \$DAMOZP* Hourly day-ahead market Ontario zonal price in dollars for *market participant* k at *delivery point* m in *settlement hour* h

For both “dispatchable market participants” and “non-dispatchable market participants” the Prudential Security process will continue to estimate the following *settlement amounts* as part of the *actual exposure* calculation. These *settlement amounts* include but are not limited to the following:

- Rural and Remote *Settlement* Debit
- *IESO Administration Charge*
- Transmission Charges
- Export Transmission Service Charge
- Uplifts and Ancillary Charges
- Global Adjustment (Class A or B)
- *Physical Bilateral Contract* Credit (Charge for Generators)
- Northern Industrial Electricity Rate Program
- Regulated Hydroelectric Generation Adjustment Amount
- Feed-In Tariff Program *Settlement Amount*
- Hydroelectric Contract Initiative *Settlement Amount*
- Renewable *Energy Standard Offer* Program *Settlement Amount*
- Ontario Clean *Energy Benefit Settlement Amount*
- Ontario Fair Hydro Plan *Settlement Amount*
- Regulated Price Plan *Settlement Amount*
- Rural and Remote *Settlement* Credits
- Transmission Credits
- Export Transmission Service Credit
- Congestion Rents and Marginal Loss Residuals

The list above will be reviewed to ensure relevancy at time of implementation of the future market. The estimation of uplift and ancillary charges will include any new or modified uplifts from *real-time market* and new uplifts from the day-ahead market for any daily, hourly, and month-end uplifts.

DAM Impact on SNI Component for Physical Transactions

The *settlement process* will provide an updated *settlement* data stream to the Prudential *Security* process for support of the calculation of the SNI component of *actual exposure* for physical transactions. This expanded *settlement* data stream will be provided by the information from the *preliminary settlement statements* and

the *final settlements statements*. All *settlement amounts* used in the SNI component will continue to be either hourly, daily or monthly charges.

The SNI component of *actual exposure* for physical transactions (AE-P) will use updated *settlement amounts* from the *settlement* data stream. The tables below illustrate the new *settlement amounts*, amended *settlement amounts*, replaced *settlement amounts* and disposed *settlement amounts*. Refer to the Market *Settlement* detailed design document for the types of *market participants* that these *settlement amounts* will apply to.

NOTE: The *settlement amounts* below are subject to change pending the completion of the Market Settlement detailed design document.

Table 3-3: New Settlement Amounts used for the SNI component

Settlement Amount
Hourly Physical Transaction Settlement Amount {1}
Hourly Physical Transaction Settlement Amount {2}
Hourly Virtual Transaction Settlement Amount {1}
Hourly Virtual Transaction Settlement Amount {2}
Hourly Physical Transaction Settlement Amount – Physical Bilateral Contract {1}
Hourly Physical Transaction Settlement Amount – Physical Bilateral Contract {2}
DAM Hourly Operating Reserve Settlement Amount {1}
DAM Hourly Operating Reserve Settlement Amount {2}
DAM Operating Reserve Uplift
DAM Make-Whole Payment
DAM Make-Whole Payment Uplift
DAM Reliability Unit Commitment Uplift
Real-Time Market Make-Whole Payment
Real-Time Market Make-Whole Payment Uplift
DAM Transmission Rights Settlement Credit
Congestion Rents and Marginal Loss Residuals
Generator Offer Guarantee
Generator Offer Guarantee Uplift
NQS Failure Charge

Settlement Amount
NQS Failure Charge Uplift
Reference Level Settlement Amount
Reference Level Settlement Amount Uplift

Table 3-4: Amended Settlement Amounts used for the SNI component

Current Real-Time Market Settlement Amount	Amendments after DAM Implementation
<i>Operating Reserve Shortfall Settlement Debit</i>	Amended to reflect the new DAM <i>settlement amount</i> for <i>operating reserve</i> .
<i>Intertie Offer Guarantees and Intertie Offer Guarantee OFFSET</i> for wheel-through transactions	Amended to reflect applicability only in real-time and interactions with RT Make-Whole Payment.
<i>Generation Station Service Rebate</i>	Amended to reflect new DAM and RT <i>settlement amounts</i> for uplifts.
Administration Pricing	Amended to reflect new DAM and PD failure procedures.
Real-Time Import Failure Charge	Amended to incorporate new <i>intertie</i> congestion pricing rules.
Real-Time Export Failure charge	Amended to incorporate new <i>intertie</i> congestion pricing rules.

Table 3-5: Replaced Settlement Amounts used for the SNI component

Current Real-Time Market Settlement Amount	Replacement after DAM Implementation
Net Energy Market Settlement Credit (NEMSC)	Replaced by the first and second <i>settlement</i> components of Hourly Physical Transaction Settlement Amount (HPTSA).
Operating Reserve Settlement Credit (ORSC)	Replaced by the first and second settlement components of Hourly Operating Reserve Settlement Amount (HORSAs).
Hourly Uplift (HUSA) – Operating Reserve component	Replaced by the DAM Operating Reserve Uplift (DORU).

Current Real-Time Market Settlement Amount	Replacement after DAM Implementation
Generation Cost Guarantee Payment	Replaced by Generator Offer Guarantee (GOG).
Generation Cost Guarantee Recovery Debit	Replaced by Generator Offer Guarantee Uplift
Day-Ahead Production Cost Guarantee	Replaced by DAM Make-Whole Payment
Transmission Rights Settlement <i>Credit</i> (<i>settlement amount</i> used from the current <i>TR market</i>)	Replaced by DAM Transmission Rights Settlement Credit (<i>settlement amount</i> to be used in the future <i>TR market</i>)

Table 3-6: Disposed of Settlement Amounts not to be used for the SNI component

Current Real-time Market Settlement Amount
Hourly Uplift (HUSA) – Congestion Management Settlement Credit component
Hourly Uplift (HUSA) – NEMSC component
Hourly Uplift (HUSA) – Ramp Down Settlement Amount component
Hourly Uplift (HUSA) – Day-Ahead Import Failure Charge component
Hourly Uplift (HUSA) – Day-Ahead Export Failure Charge component
Hourly Uplift (HUSA) – Day-Ahead Linked Wheel Failure Charge component
Congestion Management Settlement Credit for Energy (CMSC)
Ramp Down Settlement Amount (RDSA)
Day-Ahead Intertie Offer Guarantee (DA_IOG)
Day-Ahead Import Failure Charge
Day-Ahead Export Failure Charge
Day-Ahead Linked Wheel Failure Charge
Day-Ahead Generator Withdrawal Charge

3.5.6. Data Input Requirements for Physical Transaction Monitoring of Actual Exposure

The monitoring of *actual exposure* for physical transactions will continue to be initialized and then maintained through the collection of data inputs from various data sources from within the *IESO*. Some of this data may be revised periodically based on *IESO* assessments.

Table 3-7 summarizes the various data sources, the type of data obtained from those sources and its usage within monitoring of *actual exposure* for physical transactions.

Table 3-7: Data Inputs Required to Support Monitoring of Physical Transaction Actual Exposure

Data Source	Type of Input Data	Usage within the Prudential process to support monitoring physical transactions
Real-time (RT) calculation engine	Hourly average <i>real-time market</i> locational marginal prices.	Physical transaction <i>actual exposure</i> calculations: <ul style="list-style-type: none"> • CNS component for all “dispatchable market participants”.
Day-ahead market (DAM) calculation engine	Day-ahead market schedules; and Day-ahead market locational marginal prices.	Physical transaction <i>actual exposure</i> calculations: <ul style="list-style-type: none"> • CNS component for all “dispatchable market participants”.
	Hourly day-ahead Ontario zonal price of <i>energy</i>	Physical transaction <i>actual exposure</i> calculations: <ul style="list-style-type: none"> • CNS component for all <i>non-dispatchable loads</i>.
Meter Data Management System	Actual quantities of <i>energy</i> injected (AQEI); and Actual quantities of <i>energy</i> withdrawn (AQEW)	Physical transaction <i>actual exposure</i> calculations: <ul style="list-style-type: none"> • CNS component for “dispatchable market participants” and “non-dispatchable market participants”.

Data Source	Type of Input Data	Usage within the Prudential process to support monitoring physical transactions
Settlement System	<i>Preliminary settlement statement and final settlement statement</i> data for all <i>energy market participants</i> plus additional information.	Physical transaction <i>actual exposure</i> calculations: <ul style="list-style-type: none"> • SNI component for all generation and load <i>delivery points</i> and <i>boundary entities</i>. • Rate information for various charge types and amounts published by <i>settlement</i> and the <i>OEB</i>
Market Invoicing and Payments	Invoicing Data, <i>Margin Call</i> Payments and Voluntary Prepayments	<ul style="list-style-type: none"> • Identifies all prepayments applied to the previous <i>billing period</i>. Any remaining prepayments on account will be carried forward on account to the next <i>billing period</i>. • Transfers the following prepayments to Prudential Security process without the need to differentiate between prepayments between physical and virtual transactions: <ul style="list-style-type: none"> ○ Marginal Call Payments ○ Voluntary Prepayments • Charge type data for “non-metered participants”

The usage of this data is described in Section 3.5.5: Monitoring Actual Exposure for Physical Transactions.

3.5.7. Margin Warnings and Margin Calls for Physical Transactions

The AE-P of a *market participant* engaging in physical transactions in the day-ahead market will be fully integrated within the AE-P calculations for their *real-time market* activity. The same integration also holds true for the issuance of margin warnings and *margin calls*.

Market participants engaging in physical transactions will continue to receive margin warnings and *margin calls* based on their AE-P for their *day-ahead market* and *real-time market* activity monitored against their *trading limit*. Margin warnings will continue to be issued once the AE-P of a *market participant* reaches 70% of their *trading limit*. *Margin calls* will continue to be issued once the AE-P of a *market participant* reaches 100% of their *trading limit*.

Once a *margin call* is issued, the information is made available to IESO's Market Cash Management function from the Prudential Security process. The Prudential Security process then waits for payment from IESO's Market Invoicing and Payments, which receives the *market participant's* payment details from Market Cash Management function. The *market participant* will continue to be required to make a payment by 4:00 pm eastern prevailing time (EPT) on the second *business day* following the date of the *margin call*. The *market participant* must also continue to bring down the AE-P to at least 75% of the *trading limit* to satisfy the *margin call*. In the event a *margin call* is not satisfied by 4:00 pm EPT on the second *business day* following the date of the *margin call* and all attempts to satisfy the default are unsuccessful, the IESO will continue to have the authority to draw down on *prudential support* for physical transactions.

3.6. Virtual Transactions

3.6.1. Overview

A separate methodology is required to calculate the *prudential support obligation* and *actual exposure* for virtual transactions based on the risk characteristic that a virtual transaction has no limit on the quantity of *energy* that a *market participant* may trade.

Due to the additional, inherent financial risks virtual transactions impose, *market participants* will be required to separately authorize for virtual transaction trading privileges in the day-ahead market and provide separate *prudential support*.

Sections 3.6.2, 3.6.3 and 3.6.4 describe the prudential requirements for virtual transactions in the future day-ahead market and *real-time market*.

3.6.2. Prudential Support Obligation for Virtual Transactions

The *prudential support obligations* determined for virtual transactions will be different from the *prudential support obligations* determined for physical transactions. *Market participants* who are authorized to trade in virtual transactions will be limited to having their *prudential support obligations* determined under a *margin call* methodology. This means that a *market participant* will not be eligible for the *no margin call option* if they participate in both physical and virtual transactions.

The methodology to determine the required *prudential support obligation* for virtual transactions will be as follows:

1. The IESO will determine a single absolute day-ahead market to *real-time market price* delta based on historical price deltas observed from all nine virtual transaction zonal trading entities.

2. The authorized *market participant* will submit to the *IESO*, an absolute value of the maximum daily *trading limit* (in MWh) for virtual transactions. The maximum daily *trading limit* (in MWh) submitted by the *market participant* will form the basis of the virtual transaction *bid/offer* limit used in the *dispatch data* submission and validation for virtual transaction *bids* and *offers*. For *dispatch data* validation requirements for virtual transactions, refer to the *Offers, Bids* and Data Inputs detailed design document.
3. The *IESO* will set a *trading limit* assessment period in calendar days.
4. The *IESO* will set a virtual transaction uplift estimation rate in \$/MWh.

The *IESO* will determine the required virtual transaction *prudential support obligation* based on the maximum daily *trading limit* (in MWh) submitted by the *market participant*. The virtual transaction *prudential support obligation* will be the sum of the *IESO* determined *minimum trading limit* (in dollars) and the *IESO* determined *default protection amount*.

These processes are described in greater detail in the sub-sections that follow.

Enduring Price Delta for the Prudential Support Obligation

To determine the price delta ($\Delta \text{DAP}_{\text{VT}}$, ARTP_{VT}) used to calculate the *prudential support obligation* for virtual transactions, the *IESO* will use the 97th percentile of the absolute value of historical price deltas observed over the most recent three years from all nine virtual transaction zonal trading entities. The review period to reassess the price delta will be one year. If there is a change of 15% or more from the price delta, the *IESO* will calculate a new price delta to determine the *prudential support obligation*. The *IESO* will have the discretion to increase or decrease the 15% basis and the discretion to shorten the review period at any time.

Interim Price Delta for Prudential Support Obligation

The *IESO* will need to use an interim price delta ($\Delta \text{DAP}_{\text{VTI}}$, ARTP_{VTI}) for the period immediately after the opening of the future day-ahead market and *real-time market* because the *IESO* will not have three years' worth of its own actual price delta information. Similar to the enduring price delta, the *IESO* will use the 97th percentile of interim price delta data to set the interim price delta to be used for the *prudential support obligation*. This data set will also be based on three years of historical data at any given point in time and will be updated on a yearly basis. When determining the interim price delta, the *IESO* will consider a number of factors including, but not limited to:

- Shadow prices from the current day-ahead commitment process (DACP) and the *real-time market*; and/or

- Price delta information from day-ahead markets and *real-time markets* in neighbouring jurisdictions; and/or
- Temporal weightings of the data used to calculate the day-ahead to real-time price delta.

One of the methods the *IESO* may use to temporally weight the interim price delta data, involves giving a lower weighting to the initial interim data as data from the future market begins to accumulate. The review period to reassess the price delta will be one year. If there is a change of 15% or more from the interim price delta, the *IESO* will calculate a new price delta to determine the *prudential support obligation*. The *IESO* will also have the discretion to increase or decrease the 15% basis and the discretion to shorten the review period to a shorter period at any time during the interim period.

Minimum Trading Limit Calculation for Virtual Transactions

The *minimum trading limit* (in dollars) for virtual transactions, based on a maximum daily *trading limit* (in MWh) submitted by a *market participant*, will be determined by the *IESO* as follows:

$$TL_{VT\$} = [(TL_{VT} \times \Delta DAP_{VT}, ARTP_{VT} \times \#Days_{TL}) + (U_{VT} \times TL_{VT} \times \#Days_{TL})]$$

Where,

$TL_{VT\$}$ *minimum trading limit* (in dollars)

TL_{VT} the *market participant* submitted absolute value of the maximum daily *trading limit* (in MWh) for virtual transactions. This maximum daily *trading limit* (in MWh) will be applicable for all future *billing periods* until a revised maximum daily *trading limit* is submitted by that *market participant*. If a *market participant* submits a revised maximum daily *trading limit* (in MWh), this *trading limit* will supersede any previous maximum daily *trading limit* (in MWh) once approved by the *IESO*. The maximum daily *trading limit* may be used as a *self-assessed trading limit* by the *market participant*

$\Delta DAP_{VT}, ARTP_{VT}$ the *IESO* determined price delta will be the absolute value of the difference between the hourly day-ahead virtual zonal *energy* price (DAP_{VT}) and the hourly average real-time virtual zonal *energy* price, calculated to the 97th percentile based on three years of historical data. $\Delta DAP_{VT}, ARTP_{VT}$ will be updated once a year;

$\#Days_{TL}$ the *trading limit* assessment period for virtual transactions denoted as a number of calendar days. The *IESO* will typically use two calendar days for the *trading limit* assessment period. The *trading limit* assessment period may be increased up to seven calendar days by the *IESO* if the *market participant* was subject to more than one *margin call per energy market billing period*

U_{VT} the virtual transaction uplift estimation rate in \$/MWh. This is the *IESO's* daily estimation of day-ahead market *reliability* unit commitment uplift amounts that may be incurred by virtual transaction *offers* to provide *energy*

The *IESO*-determined *minimum trading limit* for virtual transactions will be the *trading limit* for virtual transactions.

Establishment of a Default Protection Amount by the IESO

The *default protection amount* for virtual transactions will be determined by the *IESO* as follows:

$$DPA_{VT\$} = [(TL_{VT} \times \Delta DAP_{VT}, ARTP_{VT} \times \#Days_{DPA}) + (U_{VT} \times TL_{VT} \times \#Days_{DPA})]$$

Where,

TL_{VT} the *market participant* submitted absolute value of the maximum daily *trading limit* for virtual transactions (in MWh), described above

$\Delta DAP_{VT}, ARTP_{VT}$ the *IESO*-determined historical day-ahead-to-real time price delta observed over the most recent three years from all nine virtual zonal trading entities, as described in the previous sub-section

$\#Days_{DPA}$ *Default protection amount* assessment period for virtual transactions in number of calendar days. The length of time used will be seven days

U_{VT} the virtual transaction uplift daily estimation rate, in \$/MWh, as described in the previous sub-section

Allowable Reductions

Market participants that are considered net debtors will not be allowed any reductions to their *prudential support obligation* for virtual transactions. *Market*

participants that qualify for net creditor status will be allowed reductions to their *prudential support obligation* for virtual transactions as described in the Net Creditor Status Reduction to Prudential Support for Virtual Transactions section.

IESO Reassessment of Prudential Support Obligations

The process of reassessing the *prudential support obligation* for virtual transactions may be triggered by any one of the following changes, but not limited to:

- amendments by the *market participant* to their previously submitted maximum daily *trading limit* (in MWh) for virtual transactions, subject to restrictions on how frequently this value can be updated by the *market participant*;
- exceeding a *trading limit* (in dollars);
- a shift in the *IESO*-determined price delta by 15% or more at any time during the year; and
- the *IESO*'s adjustment of a *market participant's minimum trading limit* as a result of issuing one or more *margin calls* over the course of a *billing period*;

In all such cases where the *prudential support obligation* increases, *market participants* must respond by providing additional *prudential support* for virtual transactions. In the event a *market participant* fails to provide and maintain *prudential support* within the required time period, the *IESO* will continue to treat this as an *event of default*.

3.6.3. Forms of Virtual Transaction Prudential Support

If a *market participant* is authorized to engage in virtual transactions, the form of acceptable *prudential support* will be restricted to an irrevocable letter of credit. If a *market participant* is authorized to transact in both virtual transactions and physical transactions, the forms of *prudential support* for physical transactions will remain unchanged. It will be necessary that the physical transactions *prudential support* along with any related legal agreements be clearly distinguished from the virtual transactions *prudential support*. The *IESO* will have both physical and virtual forms of *prudential support* available to draw upon in the event of a default by a *market participant* engaging in both physical and virtual transactions.

For further information on modifications to Online *IESO* and the Prudential Manager that will support the distinction between physical and virtual forms, see Appendix A: Market Participant Interfaces.

Net Creditor Status Reduction to Prudential Support for Virtual Transactions

For *market participants* who are consistently *market creditors* based on their physical transactions as a *metered market participant* in the future day-ahead market and *real-time market*, provisions will be made to allow them to use a portion of their average credit position as a reduction to their virtual transaction *prudential support obligation* (PSO) as follows:

- PSO_{VT} for a *market participant* that is *market creditor* = *IESO*-determined *minimum trading limit* ($TL_{VT\$}$) + *IESO*-determined *default protection amount* ($DPA_{VT\$}$) less 75% of the average of their most recent six consecutive invoices if those invoices were all net credit positions.

For the period of transition to the future day-ahead market and *real-time market*, the most recent six consecutive credit invoices can include all six invoices from the current *real-time market*, the future day-ahead market and *real-time market*, or a combination of the two. If the virtual transaction *prudential support obligation* for a net *market creditor* is higher than what can be covered by the allowable reduction, then an irrevocable letter of credit will still be required to cover the shortfall.

In order to account for any unexpected fluctuations and the ability of the *IESO* to rely upon such a position for prudential *security* purposes, the *market rules* will give the *IESO* authority to adjust the number of consecutive *invoice* periods required to satisfy the *market creditor* position. The *IESO* will also have the authority to adjust the percentage value of the six consecutive credit *invoices* used to satisfy all or part of a *market creditor's prudential support obligation* for virtual transactions. The scenarios where the *IESO* may adjust these components of the calculation will be specified in the *market rules* and *market manuals*.

The *IESO* will review the criteria that *market participants* need to meet to satisfy and maintain the *market creditor* status on a monthly basis. If the *market participant* receives a debit *invoice*, they may lose their *market creditor* position at the *IESO's* discretion and may not achieve *market creditor* status until they accumulate another six consecutive credit *invoices*. Any *prudential support* on hand used to satisfy all or part of a *market participant's minimum trading limit* (in dollars) for virtual transactions will remain to satisfy such obligation unless the *IESO* retracts the *market creditor* status. A pledge agreement between the *market participant* and the *IESO* will be made to ensure the *market participant's* receivables are available to be pledged as collateral.

3.6.4. Data Input Requirements for Virtual Transaction Prudential Support Obligation

Similar to physical transactions, *prudential support obligations* for virtual transactions will be initialized and maintained through the collection of data from

market participants and other institutions such as banks and credit rating agencies. This data may be revised periodically based on *IESO* assessments or based on changes provided by a *market participant*.

Online *IESO* will be used to support the Prudential Security process for virtual transactions in the future day-ahead market and *real-time market*. Table 3-8 summarizes the types of input data from other data sources that will have to be collected to facilitate the *prudential support* process for virtual transactions.

Table 3-8: Data Inputs that Support Prudential Support Obligations for Virtual Transactions

Data Source	Type of Input Data	Usage within the Prudential Security process to support Prudential Support Obligation
Online IESO (Authorization and Participation Module)	<i>Market Participant</i> submitted Absolute Value of the Maximum <i>Trading Limit</i> (in MWh)	<ul style="list-style-type: none"> Used to support their <i>prudential support obligation</i> calculation for virtual transactions
Real-time (RT) calculation engine	Virtual transaction zonal trading entity <i>energy</i> prices	<ul style="list-style-type: none"> Used to support their <i>prudential support obligation</i> calculation for virtual transactions
Day-ahead market (DAM) calculation engine	Virtual transaction zonal trading entity <i>energy</i> prices	<ul style="list-style-type: none"> Used to support their <i>prudential support obligation</i> calculation for virtual transactions
Settlement System	Virtual Transaction Uplift Estimation Rate in \$/MWh.	<ul style="list-style-type: none"> Used to support their <i>prudential support obligation</i> calculation for virtual transactions
Market Invoicing and Payments	<i>Invoice</i> Data	<ul style="list-style-type: none"> Used to determine net creditor status for <i>market participants</i> and their resulting net credit status reduction for virtual transactions Used to determine a <i>market participant's prudential support obligation</i> offset amount for virtual transactions

The impact of these data inputs to various *market participant* interfaces used to support the Prudential Security process are further described in Appendix A: Market Participant Interfaces.

3.6.5. Monitoring Actual Exposure and Screening for Virtual Transactions

Virtual transactions will be monitored using two controls. The first control involves the daily screening of virtual transactions *bids* and *offers* that have been submitted-but-not-cleared (SNC) using the submitted megawatts against the *market participant*-supplied absolute value of the maximum daily *trading limit* (in MWh). The second control involves the daily monitoring of *actual exposure* for virtual transactions (AE-V) against their *IESO*-determined *minimum trading limit* (in dollars).

These controls require the use of the day-ahead to real-time price deltas and are described in greater detail in the sub-sections that follow.

Enduring Price Delta for Monitoring Actual Exposure and Screening

To support the daily SNC screening calculation and daily CNS component calculation for monitoring *actual exposure*, the *IESO* will calculate for each of the nine virtual zonal trading entities, the 97th percentile of the absolute value of historical day-ahead market to *real-time market price* deltas (ΔDAP_{VTZ} , $ARTP_{VTZ}$) observed 30 days before the *trading day* of the current year and 30 days prior and after the same day and month for the prior two years. If the price delta is not within 15% of the actual price differences within a virtual transaction zonal trading entity, the *IESO* will have the discretion to adjust the price delta at any time for that virtual zonal trading entity. The *IESO* will also have the discretion to increase or decrease the 15% basis at any time.

Interim Price Delta for Monitoring Actual Exposure and Screening

The *IESO* will need to use an interim price delta (ΔDAP_{VTZI} , $ARTP_{VTZI}$) to support the daily SNC calculation for screening and CNS component calculation for monitoring *actual exposure* for the period immediately after the opening of the future day-ahead market and *real-time market* because the *IESO* will not have enough of its own actual price-delta information. Similar to the enduring price delta, the *IESO* will use the 97th percentile of interim price delta data to set the interim price delta to be used for the SNC and CNS components. The data set used will also correspond to 30 days before and after the *trading day* for the two historical years and 30 days prior to the *trading day* for the current year as mentioned in the enduring price delta sub-section above. When determining the interim price delta, the *IESO* will consider a number of factors including, but not limited to:

- Shadow prices from the current day-ahead commitment process (DACP) and the *real-time market*; and/or

- Price delta information from day-ahead markets and *real-time markets* in neighbouring jurisdictions; and/or
- Temporal weightings of the data used to calculate the day-ahead market to *real-time market price delta*.

If the price delta is not within 15% of the actual price differences within a virtual zonal trading entity, the *IESO* will have the discretion to adjust the price delta at any time for that virtual zonal trading entity. The *IESO* will also have the discretion to increase or decrease the 15% basis at any time.

Control – Daily Screening of Virtual Transactions Submitted but Not Cleared

The SNC component will be monitored daily as part of the *dispatch data* submission and validation process. The daily screening of the SNC virtual transaction *bids* and *offers* will be performed by using the following two methods:

- Screening method #1: Virtual transaction *bids* and *offers* that have been submitted but not cleared (SNC_{VT}) are screened on a daily basis against the absolute value of the maximum daily *trading limit* (TL_{VT}) supplied by the *market participant*. SNC_{VT} is defined as the absolute value of the sum of all virtual transaction *bid* and *offer* MWh quantities submitted by the *market participant* during the day-ahead market submission window; and
- Screening method #2: The *IESO* will estimate the daily dollar exposure for the absolute sum of all the virtual transaction *bids* and *offers* submitted by the *market participant* during the day-ahead market submission window (SNC_{VT\$}). SNC_{VT\$} will be screened on a daily basis against the *IESO*-determined virtual transaction *trading limit* margin.

Trading limit margin is the margin which is remaining after *actual exposure* is deducted from the virtual transaction *trading limit*. The *trading limit* margin will continue to change as the *actual exposure* changes on a daily basis. All the virtual transactions submitted by a *market participant* for the day-ahead market during the day-ahead market submission window will be rejected if either:

- Screening method #1: the absolute value of the sum of a *market participant's* submitted virtual transaction *bid* and *offer* quantities (in MWh) exceeds the *market participant's* supplied absolute maximum daily *trading limit* (in MWh) for virtual transactions; or
- Screening method #2: the *IESO*-estimated daily cumulative SNC dollar exposure exceeds the *IESO*-determined virtual transaction *trading limit* margin.

The *market participant* will receive a rejection message up until the close of the day-ahead market submission window.

For *market participants* to calculate their $SNC_{VT\$}$, the information used by the *IESO* to determine the $SNC_{VT\$}$ will be *published*.

For screening method #2, the formula used to calculate $SNC_{VT\$}$ will be:

$$SNC_{VT\$} = \sum_{m=1}^M \sum_{h=1}^{24} \left[SNC_{VT\$,m,h} \times \Delta (DAP_{VTZ\$,m,h}, ARTP_{VTZ\$,m,h}) \right] + (U_{VT} \times SNC_{VT\$,m,h})$$

Where,

$SNC_{VT\$}$	the <i>IESO</i> -estimated daily cumulative SNC dollar exposure. This dollar value will be \$0 for each trade date at the start of the day-ahead market submission window
M	the set of all virtual zonal trading entities
$SNC_{VT\$,m,h}$	the absolute sum of submitted virtual transaction <i>bids</i> and <i>offers</i> (in MWh) by <i>market participant</i> for <i>settlement</i> hour h at the virtual zonal trading entity m. The MWh value will be zero for each trade date at the start of the day-ahead market submission window
$\Delta DAP_{VTZ\$,m,h}, ARTP_{VTZ\$,m,h}$	the <i>IESO</i> -determined price deltas for each virtual zonal trading entity m will be the absolute value of the difference between the hourly day-ahead virtual zonal <i>energy</i> price ($DAP_{VTZ\$,m,h}$) and the hourly average real-time virtual zonal <i>energy</i> price ($ARTP_{VTZ\$,m,h}$) in \$/MWh, calculated to the 97th percentile based on enduring price and interim price delta methodology described in the previous sub-sections
U_{VT}	the virtual transaction uplift estimation rate, in \$/MWh. This is the <i>IESO's</i> estimation of day-ahead market <i>reliability</i> unit commitment uplift amounts that may be incurred by virtual transaction <i>offers</i> to provide <i>energy</i>

Control – Daily Monitoring of Virtual Transaction Actual Exposure (AE-V)

Virtual transaction *actual exposure* (AE-V) is defined as the sum of all financially unsettled and settled day-ahead market positions attributable to a *market participant's* virtual transactions. These virtual transactions are accrued from the start of a given *billing period* up to and including two *business days* prior to *invoice* issuance, net of any prepayments made after the issuance of the previous month's *invoice* and up to one *business day* prior to the issuance of the current month's *invoice*.

AE-V will be monitored against the *IESO*-determined virtual transaction *minimum trading limit* (in dollars) on a daily basis and used for the issuance of virtual transaction margin warnings and *margin calls*. If a *market participant* is authorized to engage in both virtual transactions and physical transactions, their consolidated *actual exposure* for both transactions will be monitored against the consolidated *IESO*-determined *trading limit* (in dollars) for both transactions. Refer to Section 3.7.1 that discusses the consolidated *actual exposure* monitoring process.

The *IESO* will determine a *market participant's* AE-V using the following components:

- The CNS component will be the sum of virtual transaction *bids* and *offers* for the past six rolling days that have cleared the day-ahead market and *real-time market* but have not yet been settled. The six days of CNS can be further broken down into the following two categories:
 - The day-ahead market CNS (CNS_{DAM}) component of virtual transaction *actual exposure*, which will include virtual transaction day-ahead market schedules and virtual zonal trading entity price deltas.
 - The *real-time market* CNS (CNS_{RTM}) component of virtual transaction *actual exposure*, which will include virtual transaction day-ahead market schedules, virtual zonal *energy* prices from the day-ahead market and virtual zonal *energy* prices from the *real-time market*.
- The SNI component of virtual transaction *actual exposure*, which will include the settled value of virtual transactions plus any associated day-ahead market *reliability* unit commitment uplift.
- The prepayment component of *actual exposure*, which the *IESO* will include to reduce *actual exposure*. Similarly, the *IESO* will continue to add any prepayment for which a refund has been issued to the *market participant's* *actual exposure*.

The calculation for each AE-V component is described in the following sub-sections.

CNS_{DAM} Calculations for Virtual Transactions

When a virtual transaction clears in the day-ahead market, it will be considered to be CNS in the day-ahead market (CNS_{DAM}) until the virtual zonal *energy* prices are available from the *real-time market*. The CNS_{DAM} calculation for virtual transactions will be attributed to the *market participant* submitting the corresponding virtual transaction *bids* and *offers* in the day-ahead market. CNS_{DAM} calculations for virtual transactions are based on the virtual transaction day-ahead market schedules and virtual zonal *energy* price deltas.

The CNS_{DAM} for virtual transactions will be determined by the *IESO* as follows:

$$CNS_{DAM} = \sum_{m=1}^M \sum_{h=1}^{24} \left[(|DAM_QVSI_{m,h} - DAM_QVSW_{m,h}|) \times \Delta (DAP_{VT_{m,h}}, ARTP_{VT_{m,h}}) \right] + (U_{VT} \times DAM_QVSI_{m,h})$$

Where,

$DAM_QVSI_{m,h}$	the virtual transaction quantity scheduled for injection or sale in the day-ahead market by <i>market participant</i> for <i>settlement hour</i> h at the virtual zonal trading entity m as provided by the DAM calculation engine
$DAM_QVSW_{m,h}$	the <i>virtual transaction</i> quantity scheduled for withdrawal or purchase in the day-ahead market by <i>market participant</i> for <i>settlement hour</i> h at the virtual zonal trading entity m as provided by the DAM calculation engine
M	the set of all virtual zonal trading entities
$\Delta DAP_{VT_{m,h}}, ARTP_{VT_{m,h}}$	the <i>IESO</i> -determined price delta for each virtual zonal trading entity as the absolute value of the difference between the hourly day-ahead virtual zonal <i>energy</i> price (DAP_{VTZ}) and the hourly average real-time virtual zonal <i>energy</i> price ($ARTP_{VTZ}$) in \$/MWh, calculated to the 97th percentile based on either the interim or enduring price delta methodology for CNS transactions as mentioned in those sub-sections
U_{VT}	the virtual transaction uplift estimation rate, in \$/MWh. This is the <i>IESO's</i> estimation of day-ahead market <i>reliability</i> unit commitment uplift amounts that may be incurred by virtual transaction <i>offers</i> to provide <i>energy</i>

CNS_{RTM} Calculations for Virtual Transactions

Once the virtual zonal *energy* prices are available in the *real-time market*, the CNS_{RTM} exposure for virtual transactions that have cleared the day-ahead market will be calculated by the *IESO*. CNS will be used up until six days after the trade date the virtual transactions are submitted by the *market participant*.

CNS_{RTM} calculations for virtual transactions are based on the virtual transaction quantities cleared in the day-ahead market and the differences between the virtual zonal *energy* prices from the day-ahead market and the *real-time market*.

The CNS_{RTM} calculation for virtual transactions will be the same as the CNS_{DAM} calculation with the exception of the price delta used. For the CNS_{RTM} calculation, the *IESO*-determined price delta will be replaced with the actual price delta for the same location, day and hour as the *bid* and/or *offer*.

$$CNS_{RTM} = \sum_{m=1}^M \sum_{h=1}^{24} \left[(|DAM_QVSI_{m,h} - DAM_QVSW_{m,h}|) \times \Delta (DAP_{VT_{m,h}}, ARTP_{VT_{m,h}}) \right] + (U_{VT} \times DAM_QVSI_{m,h})$$

Where,

$DAM_QVSI_{m,h}$	the virtual transaction quantity scheduled for injection or sale in the day-ahead market by <i>market participant</i> for <i>settlement hour</i> h at the virtual zonal trading entity m as provided by the DAM calculation engine
$DAM_QVSW_{m,h}$	the <i>virtual transaction</i> quantity scheduled for withdrawal or purchase in the day-ahead market by <i>market participant</i> for <i>settlement hour</i> h at the virtual zonal trading entity m as provided by the DAM calculation engine
M	the set of all virtual zonal trading entities
$\Delta DAP_{VT_{m,h}}, ARTP_{VT_{m,h}}$	the <i>IESO</i> -determined price delta for each virtual zonal trading entity as the absolute value of the difference between the hourly day-ahead virtual zonal <i>energy</i> price (DAP_{VTZ}) and the hourly average real-time virtual zonal <i>energy</i> price ($ARTP_{VTZ}$) in \$/MWh
U_{VT}	the virtual transaction uplift estimation rate, in \$/MWh. This is the <i>IESO's</i> estimation of day-ahead market <i>reliability</i> unit commitment uplift amounts that may be incurred by virtual transaction <i>offers</i> to provide <i>energy</i>

SNI Calculations for Virtual Transactions

The calculation of the SNI component of AE-V will be supported by the *settlement* data that will be provided to the Prudential Security process. The *settlement* data will be based on the information from the *preliminary settlement statements* and *final settlement statements*.

The *settlement amounts* used for the SNI component of the *actual exposure* calculation for virtual transactions will be:

- Hourly Virtual Transaction *Settlement Amount*; and

- Day-Ahead Market *Reliability* Unit Commitment Uplift – Applies to virtual transactions to sell *energy* only;

The *settlement amounts* listed above will be provided daily from *settlement* to the Prudential Security process.

3.6.6. Publication of Day-Ahead to Real-Time Price Delta

The *IESO* will *publish* and maintain the two types of day-ahead market to *real-time market price* deltas described in Sections 3.6.2 and 3.6.5 on an ongoing basis. The first price delta used in the calculation of the *prudential support obligation* and the second price delta used in the calculation of *actual exposure* for virtual transactions. This will allow *market participants* engaging in virtual transactions the ability to assess their *prudential support obligation* and *actual exposure* (in dollars) based on their submitted *bids and offers*.

This information will allow *market participants* to determine the total cost given a desired level of virtual transaction activity and provide the *IESO* with their absolute value of the maximum *trading limit* (in MWh). For details on how frequently the day-ahead market to *real-time market price* deltas will be *published* on the *IESO* website, refer to the Publishing and Reporting Market Information detailed design document.

3.6.7. Data Input Requirements for Monitoring of Virtual Transaction Actual Exposure

The monitoring of *actual exposure* for virtual transactions will be initialized and then maintained through the collection of data inputs from various data sources from within the *IESO*. Some of this data may be revised periodically based on *IESO* assessments.

Table 3-9 summarizes the various data sources, the type of data obtained from those sources and its usage within monitoring of *actual exposure* for virtual transactions.

Table 3-9: Data Inputs that Support Monitoring of Virtual Transaction Actual Exposure

Data Source	Type of Input Data	Usage within the Prudential Process to support monitoring of virtual transactions
Energy Market Interface	Submitted virtual transaction <i>bids and offers</i> for <i>energy</i> .	Used to support the SNC component for initial screening of virtual transaction <i>bids and offers</i> for <i>energy</i> .

Data Source	Type of Input Data	Usage within the Prudential Process to support monitoring of virtual transactions
Day-ahead market (DAM) calculation engine	Virtual transaction quantities and virtual zonal <i>energy</i> prices cleared in the day-ahead market.	Used to support the CNS component for monitoring of virtual transaction <i>actual exposure</i> and SNC for screening.
Real-time (RT) calculation engine	Virtual zonal <i>energy</i> prices.	
Settlement System	<i>Preliminary settlement statement and final settlement data</i> for all <i>energy market participants</i> .	Used to support the SNI component for monitoring of virtual transaction <i>actual exposure</i> .
Market Invoicing and Payments	Invoicing Data and <i>Margin Call</i> Payments and Voluntary Prepayments	<p>Identifies all prepayments applied to the previous <i>billing period</i>. Any remaining prepayments on account will be carried forward to the next <i>billing period</i>.</p> <ul style="list-style-type: none"> • Transfers the following prepayments to the Prudential Security process without the need to differentiate between prepayments between physical and virtual transactions: <ul style="list-style-type: none"> ○ <i>Margin Call</i> Payments ○ Voluntary Prepayments

3.6.8. Margin Warnings and Margin Calls for Virtual Transactions

A *market participant* engaging only in virtual transactions will receive margin warnings and *margin calls* when their AE-V approaches or exceeds their *IESO* determined virtual transaction *minimum trading limit* (in dollars) respectively.

Similar to physical transactions, margin warnings will be issued to the *market participant* once their AE-V reaches or exceeds 70% of their *IESO*-determined virtual transaction *minimum trading limit*. *Margin calls* will be issued to *market participants* when their AE-V or reaches or exceeds 100% of their *IESO*-determined virtual transaction *minimum trading limit*. Once a margin warning or *margin call* is issued, the information is made available to the *IESO*'s Market Cash Management function from the Prudential Security process. The Prudential Security process then waits for payment from *IESO*'s Market Invoicing and Payments, which receives the *market participant's* payment details from Market Cash Management function.

If a *margin call* is issued to a *market participant* only engaging in virtual transactions, the *IESO* will temporarily disable a *market participant's* virtual transaction trading privileges and the *market participant* will be required to make a payment by 4:00 pm EPT on the second *business day* following the date of the *margin call*. The *market participant's* virtual transaction trading privileges will be reinstated after they bring their AE-V to at least the dollar equivalent of 75% of their *minimum trading limit* (in dollars). Once the *margin call* is satisfied by the *market participant*, the *IESO* will reinstate virtual transaction trading privileges.

If a *market participant* is authorized to engage in both virtual transactions and physical transactions, margin warnings will be issued when the sum of their AE-V and AE-P components reaches or exceeds 70% of their *IESO*-determined *minimum trading limits* (in dollars) for both physical and virtual transactions. *Margin calls* will be issued to such participants when the sum of their AE-V and AE-P components reaches or exceeds 100% of the sum of their *IESO*-determined *minimum trading limits* (in dollars) for both virtual transactions and physical transactions.

In addition, the temporary disabling of a *market participant's* virtual transaction trading privileges will continue to be applicable as described above. The *IESO* will disable a *market participant's* virtual transaction trading privileges by reducing the absolute value of the maximum daily *trading limit* (in MWh) to zero.

3.7. Consolidated Processes

3.7.1. Consolidated Actual Exposure Monitoring for Physical and Virtual Transactions

Throughout this document, separate *prudential support obligation* calculations and separate *actual exposure* calculations have been discussed where a *market participant* transacts only in physical trading or only in virtual trading.

Where a *market participant* is authorized to transact in both physical and virtual transactions, the *IESO* will monitor the *market participant's* consolidated *actual exposure* against their consolidated *trading limit* (in dollars). As a result, the *IESO* will issue one margin warning and one *margin call* by using the consolidated *actual exposure* of physical and virtual transactions monitored against the consolidated physical and virtual transactions *trading limit* (in dollars) for the same *market participant*.

This methodology of monitoring allows the *market participant* to use their consolidated available *trading limit* to engage in physical and virtual transactions. Below is a categorized summary of prudential *security* impacts where a *market participant* is authorized to transact in only physical or virtual transactions or both physical and virtual transactions.

A *market participant* solely authorized to participate only in physical transaction or solely authorized to participate only in virtual transaction:

1. Separate margin warning and *margin call* for physical and virtual transactions.
2. Margin warning issued at 70% and *margin call* issued at 100% or greater of the respective *trading limits* (in dollars).
3. Prepayments applied to *actual exposure*.
4. Immediate disabling of virtual trading privileges when AE-V reaches 100% of the virtual *trading limit* (in dollars) but no immediate suspension of physical transactions when AE-P reaches 100% of their physical *trading limit* (in dollars).

A *market participant* authorized to participate for both physical and virtual transactions:

1. One margin warning and *margin call* issued against the consolidated *trading limit*.
2. Margin warning issued at 70% and *margin call* issued at 100% or greater of consolidated *actual exposure* for physical and virtual transactions.
3. Prepayment applied as one against the consolidated *actual exposure* for physical and virtual transactions.
4. Immediate disabling of virtual trading privileges when the consolidated AE reaches 100% of the consolidated *trading limit* but no immediate suspension of physical transactions when the consolidated AE reaches 100% of the consolidated *trading limit*.

3.7.2. Prepayment and Invoicing

Currently in the *real-time market*, physical transaction activity flows into the monthly *invoice* in accordance with the *IESO's* normal billing and payment terms. In the future day-ahead market and *real-time market*, this monthly *invoice* will consolidate physical and virtual transaction activity. Due to the consolidation of physical and virtual transaction activity on the *invoice*, the *IESO* will have the ability to draw-down on both physical and virtual transaction *prudential support* in the event a *market participant* defaults on their *invoice* payment. In addition, all causes for *event of default* under the current *real-time market* will continue in the future.

Prepayment will allow *market participants* to maintain sufficient collateral for virtual transactions over a monthly *billing period* without extending a posted irrevocable letter of credit by permitting voluntary prepayments to reduce *actual exposure* during the *billing period*.

The *invoice* for a *market participant* also informs the amount of their *prudential support obligation* by means of the *IESO*-calculated *actual exposure*. A *market participant's actual exposure* takes into account voluntary prepayments and *margin call* payments received by the *IESO* and this information is documented in the *invoice*. Therefore, this information must be communicated between the Market Invoicing and Payments sub-process and the Prudential Security process by means of the *invoice*. For further details on *invoicing*, see the Market Billing and Funds Administration detailed design document.

3.7.3. Default Levy

The *IESO* will have the authority to draw down on *prudential support* for both physical and virtual transactions if the *market participant* has posted *prudential support* for both transactions. The *IESO* will have the authority to draw down on *prudential support* in the event a *margin call* is not satisfied by 4:00 pm EPT on the second *business day* following the date of the *margin call* and all attempts to satisfy the default are unsuccessful.

In the event the posted *prudential support* does not fully satisfy an *event of default*, the *default levy* process under the current *real-time market* will continue under the future day-ahead market and *real-time market*. However, it will now include *default amounts* from *market participants* with virtual trading privileges. The *default amounts* for the *default levy* will now also include the exposure from *settlement amounts* in the day-ahead market. A notice of a *default levy* will continue to be issued to all *non-defaulting market participants* who were participating in the *energy* markets at the time of the failure of payment of a *defaulting market participant* irrespective of whether the default was the result of physical or virtual transactions. Similar to today's market, *default levies* will be apportioned to all *non-defaulting market participants* based on the absolute size of their *invoice* amounts. In the future market, *non-defaulting market participants* include both *market participants* engaging in physical transactions and virtual transactions.

– 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 Prudential Security detailed design, and is intended to guide the development of *market rule* amendments.

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 detailed design document. Resulting *market rule* amendments will incorporate the integration of the individual design documents.

Updates to this inventory since the publication of the Prudential Security detailed design version 1.0 have been made to capture material changes to section 3 – Detailed Functional Design. Please refer to market rule amendment proposal MR-00453: Prudential Security on the Market Renewal Implementation Engagement page to review any further changes between this inventory and the draft market rule amendments.

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 the following tables, which describe 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 Chapter 2 Impacts

Market Rule Section	Type	Topic	Requirement
Section 5.1	Existing - requires amendment	Purpose	<p>This section sets out the purpose of this Chapter, including the rights and obligations of <i>market participants</i> in providing <i>prudential support</i> on an ongoing basis in order to protect the <i>IESO</i> and <i>market participants</i> from payment defaults.</p> <p>Section 5.1.1:</p> <ul style="list-style-type: none"> This section needs to be expanded to include the day-ahead market. specify that sections 5.2 to 5.8 set out the nature and amount of <i>prudential support</i> that must be provided by <i>market participants</i> in order to conduct physical transactions in either the day-ahead market or the <i>real-time market</i>. Specify that Section 5.2 and new Section 5C set out the nature and amount of <i>prudential support</i> that must be provided by <i>market participants</i> in order to conduct virtual transactions in the day-ahead market.
Section 5.1	Existing – no change	Purpose	<p>Section 5.1.2:</p> <ul style="list-style-type: none"> This section obligates the <i>IESO</i> to review the prudential construct every three years. Provisions unaffected by the design changes specified in the Prudential Security design document.
Section 5.2	Existing - requires amendment	Market Participant Obligations	<p>This section specifies general <i>market participant obligations</i> in satisfying their <i>prudential support obligations</i>.</p> <p>Section 5.2.1:</p> <ul style="list-style-type: none"> This section needs to be expanded to encompass physical and virtual transactions in the day-ahead market. <p>Section 5.2.3:</p>

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> • Expand to specify that no <i>market participant</i> may participate in the day-ahead market, unless the <i>market participant</i> satisfies the <i>prudential support</i> requirements of the day-ahead market. <p>Section 5.2.4:</p> <ul style="list-style-type: none"> • Sub-divide references to <i>maximum net exposure</i> between: <ol style="list-style-type: none"> 1) <i>Maximum net exposure</i> for real-time and DAM physical transaction activity; and 2) <i>Maximum net exposure</i> for DAM virtual transaction activity. <p>Section 5.2.5:</p> <ul style="list-style-type: none"> • Sub-divide references to <i>prudential support</i> between: <ol style="list-style-type: none"> 1) <i>prudential support</i> for real-time and DAM physical transaction activity; and 2) <i>prudential support</i> for DAM virtual transaction activity. <p>Section 5.2.6:</p> <ul style="list-style-type: none"> • Limit applicability of this section related to prudential reductions to physical transactions only. <p>Section 5.2.8:</p> <ul style="list-style-type: none"> • Specify that this provision applies to all types of <i>prudential support</i> (physical transactions or virtual transactions).
Section 5.2	Existing – no change	Market Participant Obligations	<p>Section 5.2.2:</p> <ul style="list-style-type: none"> • This section obligates <i>market participants</i> to provide to the <i>IESO</i> and at all times maintain <i>prudential support</i> the value of which is not less than the <i>market participant's prudential support obligation</i>.

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> Provisions unaffected by the design changes specified in the Prudential Security design document. <p>Section 5.2.7:</p> <ul style="list-style-type: none"> This section obligates <i>market participants</i> to immediately notify the <i>IESO</i> if any part of their <i>prudential support</i> ceases to be current or valid for any reason. Provisions unaffected by the design changes specified in the Prudential Security design document. <p>Section 5.2.9:</p> <ul style="list-style-type: none"> This section obligates <i>market participants</i> to respond to <i>margin calls</i> in accordance with section 5.6 of the <i>market rules</i>. Provisions unaffected by the design changes specified in the Prudential Security design document.
Section 5.3	Existing - requires amendment	Calculation of Participant Trading Limit, Default Protection Amount and Maximum Net Exposure	<p>Section 5.3:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions” <p>Sections 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.3.6, 5.3.7, 5.3.8, 5.3.9, 5.3.11, 5.3.12:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only. <p>Sections 5.3.4.2, 5.3.4.3:</p> <ul style="list-style-type: none"> Amendments will be required to specify new prudential requirements on “non-metered participants”/importers: 5.3.4.2: Clarify that this section applies to <i>market participants</i> with at least three months of <i>energy market billing periods</i> in which the <i>market participant</i> has transacted in physical transactions.

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> • 5.3.4.3: specify this section is in respect to physical transactions in the <i>physical markets</i>, and that for non-metered market participants without 3 months of billing history, that the <i>minimum trading limit</i> will equal the greater of: <ul style="list-style-type: none"> ○ 5.3.4.3.1 (new) 25% of the absolute value of the <i>market participant's</i> estimate of its net <i>settlement amount</i> for the upcoming <i>energy market billing period</i>; or ○ 5.3.4.3.2 (new) \$25,000. Note: no amendments required to <i>default protection amount</i> calculation in section 5.3.8.2 which states the <i>default protection amount</i> is equal to the <i>minimum trading limit</i> as specified in section 5.3.4.3. <p>Sections 5.3.10, 5.3.10A, 5.3.10B – Price Bases Used for Determining <i>Minimum Trading Limit</i> and <i>Default Protection Amount</i>:</p> <ul style="list-style-type: none"> • Amendments will be required to edit or replace the existing use of <i>OEB</i> published prices for <i>energy</i> with – process and source to be determined: <ul style="list-style-type: none"> ○ For <i>metered market participants</i> representing <i>generation facilities, dispatchable loads</i> and price responsive loads, the higher of the average locational marginal price in the day-ahead market or the average LMP in the <i>real-time market</i>; ○ For <i>metered market participants</i> associated with <i>non-dispatchable loads</i>, the higher of the average Ontario zonal price in the day-ahead market or the average Ontario zonal price in the <i>real-time market</i>.

Market Rule Section	Type	Topic	Requirement
Section 5.4	Existing - requires amendment	Monitoring of Actual Exposure and Trading Limit	<p>Section 5.4:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions” <p>Sections 5.4.1, 5.4.2:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 5.5	Existing - requires amendment	Calculation of Actual Exposure	<p>Section 5.5:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” <p>Sections 5.5.1, 5.5.1.1, 5.5.1.2:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 5.6	Existing - requires amendment	Margin Call Requirement and the No Margin Call Option	<p>Section 5.6:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” <p>Sections 5.6.1, 5.6.2, 5.6.3, 5.6.5, 5.6.6:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only. <p>Section 5.6.4:</p> <ul style="list-style-type: none"> Specify that a <i>market participant</i> shall not be eligible for the <i>no margin call option</i> if it participates in both physical and virtual transactions.
Section 5.6	Existing – no change	Margin Call Requirement and the No Margin Call Option	<p>Section 5.6.4:</p> <ul style="list-style-type: none"> This section species that <i>market participants</i> that request the <i>no margin call option</i>, shall not be subject to <i>margin calls</i> if approved by the <i>IESO</i>.

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> Provisions unaffected by the design changes specified in the Prudential Security design document.
Section 5.7	Existing - requires amendment	Obligation to Provide Prudential Support	<p>Section 5.7:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” <p>Sections 5.7.1, 5.7.2, 5.7.3A, 5.7.3B, 5.7.5:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 5.7	Existing – no change	Obligation to Provide Prudential Support	<p>Section 5.7.3:</p> <ul style="list-style-type: none"> This section obligates the <i>IESO</i> to establish, maintain, update and <i>publish</i> a list of organizations eligible to provide <i>prudential support</i> and set aggregate limits for eligible organizations. Provisions unaffected by the design changes specified in the Prudential Security design document. <p>Sections 5.7.4 and 5.7.4A:</p> <ul style="list-style-type: none"> These sections specify limits on parental guarantees. Provisions unaffected by the design changes specified in the Prudential Security design document.
Section 5.8	Existing – requires amendment	<i>Reductions in Prudential Support Obligations</i>	<p>Section 5.8:</p> <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” <p>Sections 5.8.1, 5.8.1A, 5.8.2, 5.8.3, 5.8.4, 5.8.5, 5.8.6, 5.8.8:</p> <ul style="list-style-type: none"> Limit applicability of these sections to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.

Market Rule Section	Type	Topic	Requirement
			Section 5.8.2A: <ul style="list-style-type: none"> This section on the suspension of section 5.8.2 for <i>distributors</i> during the period of Nov 19, 2002 until February 14, 2003 is obsolete - delete this section.
Section 5.8	Existing – no change	Reductions in Prudential Support Obligations	Section 5.8.7: <ul style="list-style-type: none"> This section obligates the <i>IESO</i> to establish, maintain, update as required and <i>publish</i> a list of major bond rating agencies eligible to provide credit ratings. Provisions unaffected by the design changes specified in the Prudential Security design document.
Section 5C.1 NEW SUB-SECTION	New	Calculation of Participant Trading Limit, Default Protection Amount and Maximum Net Exposure for Virtual Transactions	New Section 5C.1: <ul style="list-style-type: none"> Provision to obligate the <i>IESO</i> to determine for each <i>market participant</i> a <i>maximum net exposure</i> for virtual transactions as the sum of the <i>market participant's trading limit</i> and the <i>market participant's default protection amount</i>. Provision to obligate each <i>market participant</i> intending to conduct virtual transactions to determine and submit to the <i>IESO</i>, the absolute value of the amount of its maximum daily <i>trading limit</i> (in MWh) at least 7 <i>business days</i> prior to the start of any <i>energy market billing period</i>. Provision to obligate the <i>IESO</i> to establish a <i>minimum trading limit</i> for <i>market participants</i> conducting virtual transactions, assuming 2 days of participation. Specify the <i>IESO</i> may use a greater number, up to and including 7 days if the <i>market participant</i> was subject to more than one <i>margin call</i> per <i>energy market billing period</i>. Codify the formula for the <i>minimum trading limit</i> with definitions of all variables used, within the provision.

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> • Specify that once a <i>market participant's trading limit</i> for virtual transactions has been established, that the <i>market participant</i> is not permitted to change or request a change to that <i>trading limit</i> during the upcoming <i>energy market billing period</i>. • Provision to obligate the <i>IESO</i> to establish a <i>default protection amount</i> for <i>market participants</i> conducting virtual transactions, assuming 7 days of participation. Codify the formula for the <i>default protection amount</i> with definitions of all variables used, within the provision. • Provision to obligate a <i>market participant</i> to provide an amount of <i>prudential support</i> to the <i>IESO</i> equal to <i>its prudential support obligation</i> for virtual transactions. • Provision to allow the <i>IESO</i> to determine all variables used in the calculation of virtual transaction <i>prudential support</i> (including but not limited to the DAM/Real-time price deltas, confidence levels, study period, etc). • Provision to obligate the <i>IESO</i> to review annually and modify the applicable price delta used in calculating <i>prudential support obligations</i> for virtual transactions if the price delta has increased or decreased by 15% or more from the price delta used by the <i>IESO</i>. The <i>IESO</i> will have the sole discretion to amend the 15% threshold to a higher or lower percentage and to review the price delta more than once per year. • Provisions to allow interim <i>IESO</i> authority for a transitional mechanism to determine the "interim price delta," and other transitional parameters required to calculate virtual transaction <i>prudential support</i>. The <i>IESO</i> will have the sole discretion to amend the 15%

Market Rule Section	Type	Topic	Requirement
			<p>threshold to a higher or lower percentage and to review the price delta more than once per year.</p> <ul style="list-style-type: none"> • Provision to obligate the <i>IESO</i> to <i>publish</i> the values of the variables (DAM/Real-time price deltas, etc) for the calculation of <i>prudential support obligations</i> for virtual transactions in accordance with established timelines/prior to the commencement of the day-ahead market, and on an ongoing basis. <p>OVERLAP: PUBLISHING AND REPORTING</p> <ul style="list-style-type: none"> • Provision on Monitoring of <i>Actual Exposure</i> for Virtual Transactions: <ul style="list-style-type: none"> ○ Obligate the <i>IESO</i> to issue a <i>margin call</i> warning when <i>actual exposure</i> is equal to or exceeds 70% of a <i>market participant's minimum trading limit</i>. ○ Obligate the <i>IESO</i> to issue a <i>margin call</i> when <i>actual exposure</i> is equal to or exceeds 100% of a <i>market participant's minimum trading limit</i>. ○ Obligate the <i>IESO</i> to temporarily disable a <i>market participant's</i> virtual transaction trading privileges until payment is received to satisfy the <i>margin call</i>. Upon receipt of payment, obligate the <i>IESO</i> to reinstate virtual trading privileges. ○ Obligate the <i>IESO</i> to reject virtual transaction <i>bids/offers</i> based on screening methodologies #1 – absolute sum of submitted <i>bids/offers</i> exceed maximum daily <i>trading limit</i>; and #2 – <i>IESO</i> estimated dollar exposure exceeds <i>IESO</i> determined <i>minimum trading limit</i> (in dollars) • Provision on Calculation of <i>Actual Exposure</i> for Virtual Transactions – define calculation of

Market Rule Section	Type	Topic	Requirement
			<p><i>actual exposure</i> to a level of detail comparable to the existing <i>market rules</i> for <i>actual exposure</i>. Specify that, if the price delta is not within 15% of the actual price differences within a virtual transaction zonal trading entity, the <i>IESO</i> will have the discretion to adjust the price delta at any time for that virtual zonal trading entity. The <i>IESO</i> will also have the discretion to increase or decrease the 15% basis at any time.</p> <ul style="list-style-type: none"> • Provision on the <i>Margin Call</i> Requirements for Virtual Transactions – similar to the existing <i>margin call</i> requirements in the <i>market rules</i>, specify minimum payment requirement, that no interest shall be paid on such payments, and deadlines for satisfying a <i>margin call</i>. • Provision on the Obligation to Provide Virtual Transaction <i>Prudential Support</i> – forms of <i>prudential support</i> for virtual transactions: <ul style="list-style-type: none"> ○ Obligate <i>market participants</i> to continually provide and maintain <i>prudential support</i> for virtual transactions; ○ Specify that <i>prudential support</i> for virtual transactions must be met through the provision to the <i>IESO</i> via a letter of credit; • Provision on Reductions in Prudential Support Obligations for Virtual Transactions: <ul style="list-style-type: none"> ○ Specify that a virtual trader that is a <i>market creditor</i> based on its physical transactions as a <i>generator</i>, that has achieved <i>market creditor</i> status in its most recent six <i>energy market billing periods</i> may receive a reduction in its <i>prudential support obligation</i> for virtual transactions by an amount up to 75% of the average amount that the <i>IESO</i>

Market Rule Section	Type	Topic	Requirement
			owes to the virtual trader during the relevant six <i>billing periods</i> .
Section 5D.1 NEW SUB-SECTION	New	Monitoring of Actual Exposure for Participants Transacting in Physical and Virtual Transactions	<p>New Section 5D.1:</p> <ul style="list-style-type: none"> • Provisions to specify that for <i>market participants</i> participating in both physical and virtual transactions, that: <ul style="list-style-type: none"> ◦ <i>Actual exposure</i> for the purposes of issuing <i>margin call</i> warnings and <i>margin calls</i> will be consolidated and monitored against a consolidated <i>trading limit</i> for physical and virtual transactions • Obligate the <i>IESO</i> to temporarily disable a <i>market participant's</i> virtual transaction trading privileges when consolidated <i>actual exposure</i> exceeds the consolidated <i>trading limit</i>, until payment is received to satisfy the <i>margin call</i>. Upon receipt of payment, obligate the <i>IESO</i> to reinstate virtual trading privileges.
Section 8	Existing – requires amendment	<i>Default Levy</i>	<p>Section 8.1.3:</p> <ul style="list-style-type: none"> • This section specifies that the <i>IESO</i> shall impose separate <i>default levies</i> in respect of each such <i>IESO-administered market</i> in accordance with this Section 8 of the <i>market rules</i>. • The only <i>IESO-administered markets</i> for which <i>default levies</i> will be issued under Section 8 of the <i>market rules</i> will be the <i>real-time market</i> and day-ahead market (physical and virtual transactions). <i>Default levies</i> will be issued on a consolidated basis for the RT and DAM – Section 8.1.3 is no longer required – delete section. <p>Section 8.1.4, 8.2.3, 8.6.1.1:</p> <ul style="list-style-type: none"> • These sections need to be expanded to include the day-ahead market.

Market Rule Section	Type	Topic	Requirement
Section 8	Existing – no change	Default Levy	Remaining sections within Section 8: <ul style="list-style-type: none"> Provisions unaffected by the design changes specified in the Prudential Security design document.

Table 4-2: Market Rule Chapter 3 Impacts

Market Rule Section	Type	Topic	Requirement
Section 6.3	Existing - no change	Events of Default	Section 6.3: <ul style="list-style-type: none"> Provisions unaffected by the design changes specified in the Prudential Security design document.

Table 4-3: Market Rule Appendix 2.3 Impacts

Market Rule Section	Type	Topic	Requirement
Section 1.1	Existing - requires amendment	Determination of Prudential Support Obligations	Section 1.1: <ul style="list-style-type: none"> This section needs to be expanded to include the day-ahead market.
Section 1.2	Existing – requires amendment	Provision of Prudential Support	Section 1.2: <ul style="list-style-type: none"> This section needs to be expanded to include the day-ahead market. Section 1.2.1: <ul style="list-style-type: none"> Specify this section applies in respect of either or both of physical transactions or virtual transactions.
Section 1.3	Existing – requires amendment	Reduction of Prudential Support Obligation for Credit Rating	Section 1.3: <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.”

Market Rule Section	Type	Topic	Requirement
			<ul style="list-style-type: none"> Limit applicability of this section to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 1.4	Existing – requires amendment	Prudential Support by way of a Third Party Guarantee	Section 1.4: <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” Limit applicability of this section to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 1.5	Existing – requires amendment	Reduction of Prudential Support Obligation for Payment History	Section 1.5: <ul style="list-style-type: none"> Amend title of section – add “for Physical Transactions.” Limit applicability of this section to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 1.9	Existing – requires amendment	Dispute Resolution	Section 1.9: <ul style="list-style-type: none"> This section needs to be expanded to include the day-ahead market.
Section 2	Existing – requires amendment	Pledge of Prudential Support in the form of Cash or Treasury Bills	Sections 2.1, 2.1.1, 2.2.2: <ul style="list-style-type: none"> Limit applicability of this section to physical transactions (in the <i>real-time market</i> and the day-ahead market) only.
Section 2A NEW SUB-SECTION	New	Pledge of Prudential Support/Right of Offset in the form of Net Creditor Status for Virtual Transactions	New Section 2A: <ul style="list-style-type: none"> Codify required legal conditions/pledge agreement to authorize the <i>IESO</i> to offset amounts owed to a <i>market participant</i> should a <i>market participant</i>, who is a <i>market creditor</i>, default on virtual transactions.

Market Rule Section	Type	Topic	Requirement
Appendix 2.3	Existing – requires amendment	Exercise of Rights and Remedies to Prudential Support	Sections 3.1 and 3.4: <ul style="list-style-type: none">• These sections need to be expanded to include the day-ahead market.

– End of Section –

5. Procedural Requirements

5.1. Market-Facing Procedural Impacts

The existing *market manuals* and training materials related to the Prudential Security process will be retained to the extent possible. The majority of changes result from the introduction of a day-ahead market, virtual transactions and locational marginal pricing within the future day-ahead market and *real-time market*. The documents most directly related to the Prudential Security process are:

Market Manuals:

- Market Manual 1: Connecting to Ontario's Power System, Part 1.5 – Market Registration Procedures;
- Market Manual 5: Settlements, Part 5.4 - Prudential Support; and
- Market Manual 5: Settlements, Part 5.9 - Settlement Payment Methods and Schedules

Training Material:

- Guide to Prudentials at the IESO.

The following tables identify sections within the *market manuals* and training materials that are related but will not require changes, sections that require modification, and new sections that will need to be added to support the Prudential Security process in the future market.

Table 5-1: Impacts to Market-Facing Procedures – Market Manual 1: Connecting to Ontario's Power System

Procedure	Type of change (no change, modification, new)	Section	Description
Part 1.5 – Market Registration Procedures	No Change	1.3 – Roles and Responsibilities	Roles and responsibilities are written at a level that still applies to the Prudential Security process for the future day-ahead and <i>real-time market</i> .

Procedure	Type of change (no change, modification, new)	Section	Description
Part 1.5 – Market Registration Procedures	No Change	2.0 – Authorize Market and Program Participation	Section is written at a level that still applies to the Prudential Security process for the future day-ahead and <i>real-time market</i> .
Part 1.5 – Market Registration Procedures	No Change	2.2 – Registering as a Market Participant	Content related to the Prudential Security process that was previously in Part 1.1 was removed when Part 1.1 was superseded by Part 1.5 in June 2020. For Prudential Security process information, readers of Part 1.5 are now referred to Market Manual 5 Settlements, Part 5.4 – Prudential Support and to the “Guide to Prudentials at the IESO”.

Table 5-2: Impacts to Market-Facing Procedures – Market Manual 5: Settlements

Procedure	Type of change (no change, modification, new)	Section	Description
Part 5.4 – <i>Prudential Support</i>	Modification	1.1 - Purpose	Process activities list needs to be updated to include references to the day-ahead market, modified obligations for physical transactions and new obligations for virtual transactions.
Part 5.4 – Prudential Support	Modification / New	1.3.1 – Assessment of Prudential Support Obligation for Physical Markets	<ul style="list-style-type: none"> • Update as required all references to the <i>real-time market</i> to include the day-ahead market. • All current <i>market rule</i> references, Online IESO references and IESO form references will need to be reviewed and updated. • <i>Prudential support obligation</i> reassessment activities for virtual transactions to be included in the list of reassessment activities related to physical transactions. • <i>Market participant</i> obligations associated with <i>self-assessed trading limit</i> to be updated to

Procedure	Type of change (no change, modification, new)	Section	Description
			<p>include similar obligations for virtual transactions.</p> <ul style="list-style-type: none"> • <i>IESO's</i> existing three stage process for assessing the <i>prudential support obligation</i> for physical transactions to be updated to include assessment of <i>prudential support obligations</i> for new "non-metered participants" engaging in physical transactions and any <i>market participant</i> engaging in virtual transactions. • Update to the prices used in determining the <i>prudential support obligation</i> for physical transactions and price-deltas to be used for virtual transactions. • Acceptable forms for <i>prudential support</i> to be updated to include the forms acceptable for engaging in virtual transactions. <p>Note: to reflect updates associated with virtual transactions noted above, new sub-sections may be included to describe:</p> <ul style="list-style-type: none"> • the assessment of <i>prudential support obligation</i> for virtual transactions; • the threshold amount by which any excess margin provided by a letter of credit to meet a <i>market participant's</i> physical transaction <i>prudential support obligation</i>, may be used as virtual transaction <i>prudential support</i>; and • the threshold amount of a net creditor position in physical transactions over a period of time defined by the <i>IESO</i> that may be used as virtual transaction <i>prudential support</i>.

Procedure	Type of change (no change, modification, new)	Section	Description
Part 5.4 – Prudential Support	Modification	1.3.2 – Daily Monitoring of Prudential Support	<ul style="list-style-type: none"> • update current provisions describing daily monitoring of <i>actual exposure</i> for physical transactions to include day-ahead market activity. • include the screening and monitoring methodologies for <i>actual exposure</i> of virtual transactions. • update <i>margin call</i> warnings and <i>margin call</i> actions by the <i>IESO</i> to account for <i>actual exposure</i> of virtual transactions. • update negative credit watch status to state it only applies to <i>market participants</i> engaging in physical transactions. <p>Note: to reflect updates associated with virtual transactions noted above, new sub-sections may be included to describe:</p> <ul style="list-style-type: none"> • daily calculation of <i>actual exposure</i> for virtual transactions; and • daily consolidated monitoring of <i>actual exposure</i> for physical transactions and virtual transactions.
Part 5.4 – Prudential Support	Modification	1.3.3 – No Margin Call Option	<i>No margin call option</i> sub-section will state it is only available for <i>market participants</i> engaging only in physical transactions.
Part 5.4 – Prudential Support	Modification	1.3.4 – Small Distributor	Update to state the provisions for a <i>small distributor</i> only apply if they are not engaging in virtual transactions.
Part 5.4 – Prudential Support	Modification	1.3.5 – LDC Prudential Credit	Update to state allowable reductions for a <i>distributor's prudential support obligation</i> do not apply for virtual transactions.
Part 5.4 – Prudential Support	No Change	1.3.6 – Event of Default	Not impacted by the Prudential Security process for physical and virtual transactions in the future day-ahead market and <i>real-time market</i> .

Procedure	Type of change (no change, modification, new)	Section	Description
Part 5.4 – Prudential Support	Modification	1.3.7 – [Intentionally Left Blank]	Consider permanent removal.
Part 5.4 – Prudential Support	No Change	1.3.8 – Capacity Prudential Requirements	Not impacted by the Prudential Security process for physical and virtual transactions in the future day-ahead market and <i>real-time market</i> .
Part 5.4 – Prudential Support	Modification	1.4 – Roles and Responsibilities	Update to include roles and responsibilities associated with <i>prudential support obligations</i> and monitoring of <i>actual exposure</i> for virtual transactions.
Part 5.4 – Prudential Support	No Change	1.5 – Contact Information	Not impacted by the Prudential Security process for physical and virtual transactions in the future day-ahead market and <i>real-time market</i> .
Part 5.4 – Prudential Support	Modification	Appendix 'A'	<ul style="list-style-type: none"> All current <i>IESO</i> form references will need to be reviewed and updated to state they are for both the day-ahead market and <i>real-time markets</i>. Pledge agreement for net creditor status may need to be created and added as a new form. Existing pledge agreement form for cash and treasury bills will need to be modified for physical transactions.
Part 5.4 – Prudential Support	Modification	Appendix 'B'	<ul style="list-style-type: none"> This section needs to include updates to physical transaction <i>prudential support obligation</i>. This section also need to include <i>prudential support obligation</i> calculation for virtual transactions.
Part 5.4 – Prudential Support	Modification	Appendix 'C'	This section needs to be restricted to the physical transaction <i>prudential support obligation</i> only.

Procedure	Type of change (no change, modification, new)	Section	Description
Part 5.9 – Settlement Payment Methods and Schedules	No Change	1.2 - Scope	Section is written at a level that still applies to the Prudential Security process for the future day-ahead and <i>real-time market</i> .
Part 5.9 – Settlement Payment Methods and Schedules	No Change	1.3.1 – Payments to the IESO	Section is written at a level that still applies to the Prudential Security process for the future day-ahead and <i>real-time market</i> .
Part 5.9 – Settlement Payment Methods and Schedules	Modification	1.5.1 – Payment Default	<ul style="list-style-type: none"> References to adjusting a <i>market participants trading limit</i> need to distinguish between physical transactions and virtual transactions. Virtual transaction <i>trading limit</i> (in MWh) will need to be stated Virtual transaction <i>trading limit</i> (in dollars) will need to be stated
Part 5.9 – Settlement Payment Methods and Schedules	No Change	1.5.3 – Default Levy	Section is written at a level that still applies to the Prudential Security process for the future day-ahead and <i>real-time market</i> .
Part 5.9 – Settlement Payment Methods and Schedules	Modification	Figure 2-4 – Workflow for Payment Default	References to prudential where required need to distinguish between physical transactions and virtual transactions.
Part 5.9 – Settlement Payment Methods and Schedules	Modification	Table 3-4 – Procedural Steps for Payment Default	References to prudential where required need to distinguish between physical transactions and virtual transactions.

Table 5-3: Impacts to Market-Facing Procedures – Training Materials

Procedure	Type of change (no change, modification, new)	Section	Description
Guide to Prudentials at the IESO	Modification	All	<ul style="list-style-type: none"> • All content will need to be revised to distinguish between physical transactions and virtual transactions. • Remove cash deposits as a form of <i>prudential support</i>. • General check for consistency with all market-facing procedures.

5.2. Internal Procedural Impacts

Most of the internal procedures currently used by the Prudential Security process will continue to have relevance in the future markets. However, many of the existing procedures will be clarified to differentiate the determination of the *prudential support obligation* and monitoring of *actual exposure* for physical transactions and virtual transactions in the future *real-time market* and the day-ahead market.

Some of the internal procedures are related to other *IESO* processes that interact with the Prudential Security process. Changes to the Prudential Security process under the market renewal program will have a minor impact on other internal manuals. However, in some areas this may be contingent upon the tools impact of the day-ahead market. Moreover, there might be some modifications required to the existing procedures to group all of the procedural tasks within the Prudential Security process between physical and virtual transactions in the day-ahead market and physical transactions in the *real-time market*. In addition, some areas of the current procedures heavily reference relevant *market rules* and supporting tools, most 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.

Changes or additions to internal *IESO* procedures are for internal *IESO* use as documented in Appendix B and are not included in the public version of this document. 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 future day-ahead market and *real-time market*.

– End of Section –

6. Business Process and Information Flow Overview

6.1. Market-Facing Process Impacts

This section provides an overview to the arrangement of processes required in order to support the overall Prudential Security process and the critical 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 information into and out of the Prudential Security process. This section now presents the Prudential Security process at the next level of detail (level 1). A further break-down of the processes presented in this section (i.e. levels 2,3,4...) falls into the realm of systems design and is beyond the scope of this document.

The data flow diagram does not illustrate:

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

What it does illustrate however, is a logical breakdown of the sub-processes that constitute a large and complex system such as the Prudential Security process. Specifically, the data flow diagram presented below illustrates:

- The Prudential Security process as a grouping of several major and tightly coupled sub-processes;
- The key information flows between each of the processes;
- External sources of key information required by the Prudential Security process;
- External destinations of key information from the Prudential Security process; and
- The same logical boundary of the Prudential Security process as illustrated in the Level 0 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 entire Prudential Security process as a series of interrelated sub-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 data flow diagram illustrated in Figure 6-1 presents the Prudential Security process for physical and virtual transactions activity. The following sections of this document will provide an overview to each of the main sub-processes of the Prudential Security process.

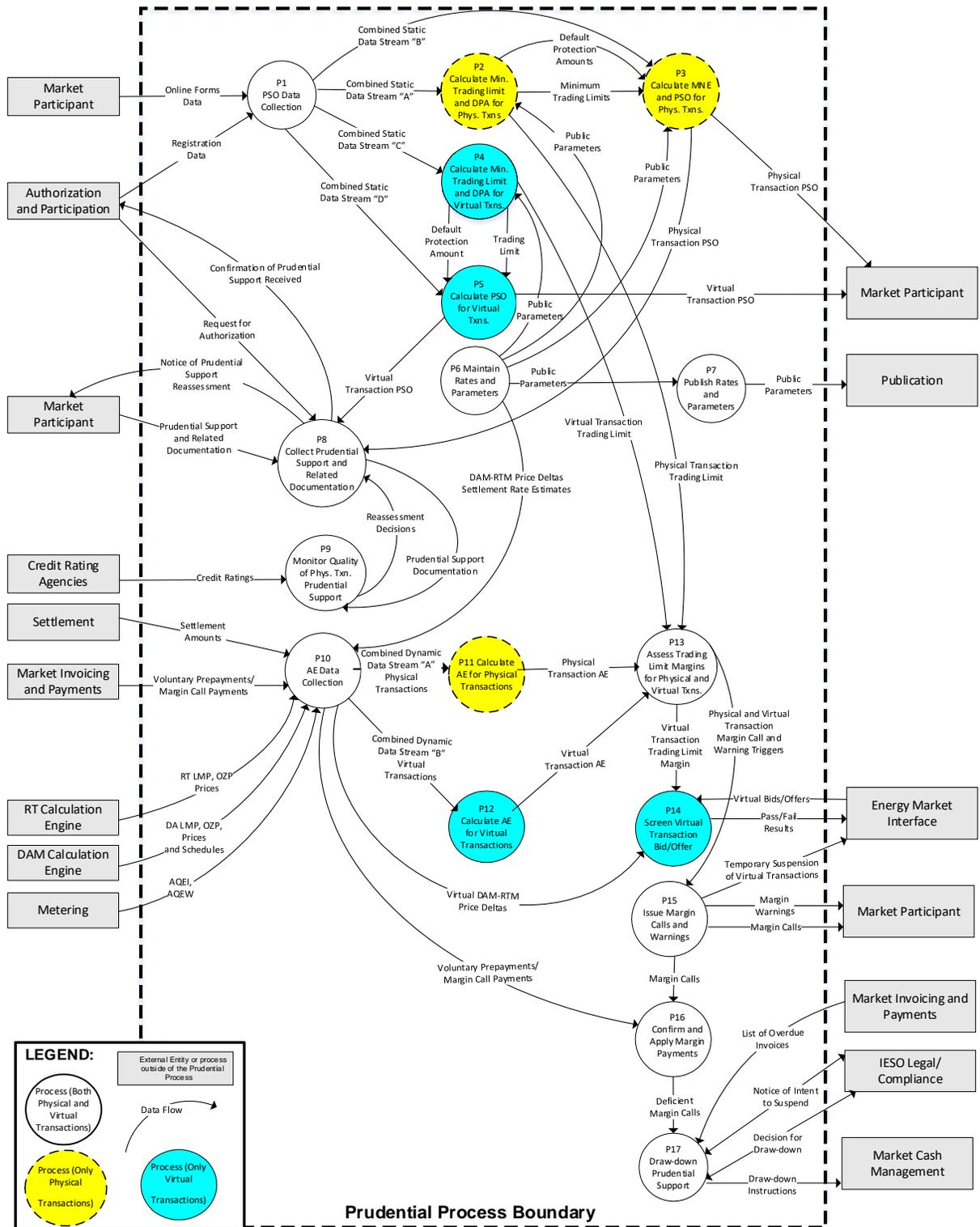


Figure 6-1: Future Prudential Process Data Flow Diagram – Level 1

6.1.1. Process P1 – Prudential Support Obligation Data Collection

Description

Process P1 receives *prudential support obligation* (PSO) data from:

- *market participants*; and
- the Authorization and Participation process.

The key processing steps are to manage the collection process, validate data for correctness and completeness and make the necessary components of these data streams available to other sub-processes related to the calculation of *prudential support obligations*.

This process relates to the collection of input data to support the calculation of *prudential support obligations* described in Section 3.5.

Input and Output Data Flows

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

Flow	Source	Target Processes	Frequency
Registration Data	Authorization and Participation process	Process P1	Periodic updates triggered by changes
<p>Description:</p> <ul style="list-style-type: none"> • Confirms status of <i>market participant's</i> authorization to trade in physical transactions: <ul style="list-style-type: none"> ○ As a “metered participant” for <i>registered facilities</i> within Ontario ○ As a “non-metered participant” conducting import and/or export transactions in specific <i>intertie zones</i>. • Confirms status of <i>market participant's</i> authorization to trade in virtual transactions: • Inform the Prudential <i>Security</i> process of temporary or permanent revocation of day-ahead market or <i>real-time market</i> trading privileges. • Provides the Prudential <i>Security</i> process with <i>market participant</i> contact information for all relevant sub-processes. 			
Flow	Source	Target Processes	Frequency
Online Forms Data	<i>Market Participant</i>	Process P1	Periodic updates triggered by changes

<p>Description:</p> <ul style="list-style-type: none"> Information received from Online <i>IESO</i> and specified documentation filled within Online <i>IESO</i> to support the establishment of <i>prudential support obligations</i> for <i>real-time market</i> trading activity, physical transactions and/or virtual transactions in the day-ahead market: All current prudential information to support <i>market participants</i> trading only in the <i>real-time market</i>. <i>Market participant</i> submitted <i>self-assessed trading limit</i> in dollars for physical transactions "metered and non-metered participant. New <i>market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> in MWh for virtual transactions. 			
Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'A' Physical Transactions	Process P1	Process P2	Periodic updates triggered by changes
<p>Description:</p> <ul style="list-style-type: none"> Portions of input data collected by Process P1 for use in the calculation of the <i>minimum trading limit</i> and <i>default protection amount</i> for day-ahead market and <i>real-time market</i> physical transaction activity (see Process P2 for further details). 			
Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'B' Physical Transactions	Process P1	Process P3	Periodic updates triggered by changes
<p>Description:</p> <ul style="list-style-type: none"> Portions of static PSO input data collected by Process P1 for use in the calculation of <i>maximum net exposure</i> and <i>prudential support obligation</i> for day-ahead market and <i>real-time market</i> physical transaction activity. (See Process P3 for further details.) 			

Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'C' Virtual Transactions	Process P1	Process P4	Periodic updates triggered by changes
<p>Description:</p> <ul style="list-style-type: none"> • Portions of static PSO input data collected by Process P1 for use in the calculation of <i>minimum trading limit</i> and <i>default protection amount</i> for day-ahead market virtual transaction activity. (See Process P4 for further details.) 			
Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'D' Virtual Transactions	Process P1	Process P5	Periodic updates triggered by changes
<p>Description:</p> <ul style="list-style-type: none"> • Portions of input data collected by Process P1 for use in the calculation of the virtual transaction <i>PSO</i> (see Process P5 for further details). 			

6.1.2. Process P2 – Calculate Minimum Trading Limit and Default Protection Amounts for Physical Transactions

Description

Process P2 utilizes data provided by *market participants* and the *IESO*-determined estimation rates and number of days to calculate a *minimum trading limit* and *default protection amount* for *physical transactions*, employing decision rules described in Section 3.5.2 of this document.

This process only requires that portion of static data collected from Process P1 pertaining to:

- participation in the *real-time market*; and/or
- participation in the day-ahead market through physical transactions.

In addition, this process makes use of specific estimation rates enumerated in Section 3.5.2 Minimum Trading Limit Estimate of this document.

Input and Output Data Flows

Table 6-2: Process P2 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'A' Physical Transactions	Process P1	Process P2	Periodic updates triggered by changes to static data
<p>Description:</p> <ul style="list-style-type: none"> • Portions of static data collected by Process P1 for use in the calculation of the <i>minimum trading limit</i> and <i>default protection amount</i> for physical transactions • This data includes: <ul style="list-style-type: none"> ○ Online <i>IESO</i> forms data; ○ <i>Market participant</i> election of <i>margin call</i> or <i>no margin call option</i>; ○ <i>Market participant</i> submitted <i>self-assessed trading limit</i>; ○ Estimated daily <i>energy</i> injections ("metered participants" only); ○ Estimated daily <i>energy</i> withdrawals ("metered participants" only); ○ Estimated peak loads for upcoming <i>billing periods</i> ("metered participants" only); <i>and</i> ○ Expected net <i>settlement amounts</i> ("non-metered participants" only). 			
Flow	Source	Target Processes	Frequency
Public Parameters Used to Calculate Prudential Support Obligation	Process P6	Process P2	Periodic updates triggered by changes to estimation rates
<p>Description:</p> <ul style="list-style-type: none"> • <i>IESO</i> estimated day-ahead market to <i>real-time market price</i> deltas for LMP and Ontario Zonal prices; and • <i>IESO</i> estimated rates applicable to "metered participants" for each type of <i>settlement amount</i> payable. See . 			

Flow	Source	Target Processes	Frequency
Physical Transactions Minimum Trading Limit	Process P2	Process P3	Periodic updates triggered by changes to estimation rates
<p>Description:</p> <ul style="list-style-type: none"> • Required by Process P3 to determine <i>maximum net exposure</i> and physical transaction <i>prudential support obligation</i>; • <i>Minimum trading limit</i> for “metered participants” covering day-ahead market and <i>real-time market</i> activity: <ul style="list-style-type: none"> ○ Estimated quantity of physical <i>energy</i> withdrawn – 7 to 49 days of expected <i>energy</i> withdrawals; ○ Estimated day-ahead market and <i>real-time market price</i> deltas for LMP and Ontario Zonal prices; ○ Estimated uplifts and charges based on expected <i>energy</i> withdrawals • <i>Minimum trading limit</i> for “non-metered participants” – <i>margin call</i> option: <ul style="list-style-type: none"> ○ 25% of <i>settlement amounts</i> for past three <i>energy</i> market <i>billing periods</i>, or ○ 25% of expected <i>settlement amounts</i> for upcoming <i>energy</i> market <i>billing period</i>. • All amounts in Canadian Dollars (\$). 			
Flow	Source	Target Processes	Frequency
Physical Transaction Trading Limit	Process P1 and P2	P13	Updates triggered by changes to estimation rates or participant submitted data
<p>Description:</p> <ul style="list-style-type: none"> • The <i>trading limit</i> for physical transactions will continue to be the greater of the <i>self-assessed trading limit</i> submitted by the <i>market participant</i> or the <i>IESO-determined minimum trading limit</i>. • All amounts in Canadian dollars (\$). 			
Flow	Source	Target Processes	Frequency

Physical Transactions Default Protection Amount	Process P2	Process P3	Periodic updates triggered by changes to estimation rates
<p>Description:</p> <ul style="list-style-type: none"> • Required by Process P3 in order to determine <i>maximum net exposure</i> and physical transaction <i>prudential support obligation</i>. • <i>Default protection amount</i> for "metered participants" <ul style="list-style-type: none"> ◦ 21 day of market activity in the day-ahead market and <i>real-time market</i>; • <i>Default protection amount</i> for "non-metered participants" <ul style="list-style-type: none"> ◦ <i>Default protection amount</i> will equal <i>IESO-calculated minimum trading limit</i>. • All amounts in Canadian Dollars (\$). 			

6.1.3. Process P3 – Calculate Maximum Net Exposure and Prudential Support Obligation for Physical Transactions

Description

Process P3 utilizes data provided by *market participants* and other *IESO* processes to determine the *prudential support obligation* for physical transactions. This process only requires that portion of static data collected from Process P1 containing *self-assessed trading limits* for this type of activity.

In addition, this process makes use of specific parameters related to reducing the *prudential support obligation* to a level lower than *maximum net exposure*, using the decision rules outlined in the *market rules*. These reductions include:

- A specified reduction for each applicable credit rating;
- A specified length of time where the *market participant* has maintained a good payment history; and
- Allowable reductions for *distributors* holding *retail* deposits.

All of these information components will be combined in Process P3 to arrive at the *prudential support obligation* for physical transactions.

Input and Output Data Flows

Table 6-3: Process P3 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'B' Physical Transactions	Process P1	Process P3	Periodic updates triggered by changes to static data
<p>Description:</p> <ul style="list-style-type: none"> • Portions of static data collected by Process P1 for use in the calculation of the <i>prudential support obligation</i> for day-ahead market and <i>real-time market</i> physical transaction activity. • This information includes: <ul style="list-style-type: none"> ○ <i>Self-assessed trading limit</i> (in dollars) for physical transactions as submitted by each <i>market participant</i>; ○ Credit Rating Information from data entered by <i>market participant</i> using Online <i>IESO</i>; and ○ Declaration of good payment history. 			
Flow	Source	Target Processes	Frequency
Physical Transaction Default Protection Amount	Process P2	Process P3	Periodic updates triggered by changes to static data
<p>Description:</p> <ul style="list-style-type: none"> • <i>Default protection amount</i> derived from days of market activity or <i>IESO</i>-determined <i>minimum trading limits</i> for: <ul style="list-style-type: none"> ○ "metered participants" – 21 days of day-ahead market and <i>real-time market</i> physical activity. ○ "non-metered participants" – equal to <i>IESO</i>-determined <i>minimum trading limit</i> • One value per <i>market participant</i> for use in physical transaction <i>prudential support obligation</i> for day-ahead market and <i>real-time market</i> physical transaction activity. • Valued in Canadian dollars (\$). 			
Flow	Source	Target Processes	Frequency

Physical Transaction Minimum Trading Limit	Process P2	Process P3	Periodic updates triggered by changes to static data
<p>Description:</p> <ul style="list-style-type: none"> • <i>Minimum Trading Limit</i> derived from <i>IESO</i> assessment of expected <i>settlement amounts</i> for: <ul style="list-style-type: none"> ○ “metered participants” 7 to 49 days of <i>energy</i> withdrawal and estimated uplifts and charges. ○ “non-metered participants” 25% of the <i>market participant’s</i> expected <i>settlement amounts</i>. • One value per <i>market participant</i> for use in physical transaction <i>prudential support obligation</i>. • Valued in Canadian dollars (\$). 			
Flow	Source	Target Processes	Frequency
Physical Transaction Maximum Net Exposure	Process P1 and P2	Process P3	Periodic updates triggered by changes to static data
<p>Description:</p> <ul style="list-style-type: none"> • <i>Maximum net exposure</i> for “metered participants” and “non-metered participants”: <ul style="list-style-type: none"> ○ Sum of the <i>default protection amount</i> and the greater of the <i>IESO</i>-determined <i>minimum trading limit</i> or the <i>self-assessed trading limit</i> submitted by the <i>market participant</i>. • “Metered participants” using <i>no margin call option</i>, <i>maximum net exposure</i> is the sum of: <ul style="list-style-type: none"> ○ <i>IESO</i>-determined <i>minimum trading limit</i> based on 49 days of day-ahead mark and <i>real-time market</i> physical transaction activity, and ○ <i>IESO</i>-determined <i>default protection amount</i> based on 21 days of day-ahead market and <i>real-time market</i> physical transaction activity. • “Non-metered participants” using <i>no margin call option</i>, <i>maximum net exposure</i> is: <ul style="list-style-type: none"> ○ 100% of estimated net <i>settlement amounts</i> for the upcoming <i>billing period</i>. • Valued in Canadian dollars (\$). 			
Flow	Source	Target Processes	Frequency

Public Parameters Used to Calculate Physical Transaction Prudential Support Obligation.	Process P6	Process P3	Periodic updates triggered by changes to estimation rates
<p>Description:</p> <ul style="list-style-type: none"> • Decision rules and parameters to reduce the <i>prudential support obligation</i> for day-ahead market and <i>real-time market</i> physical transaction activity. • Chapter 2, Section 5.8 of the <i>Market rules</i> allowable reductions including: <ul style="list-style-type: none"> ○ <i>IESO</i>-specified allowable reductions for <i>market participant's</i> credit rating; ○ Reductions for a specified length of time where the <i>market participant</i> has maintained a good payment history; and ○ Allowable reductions for <i>distributors</i> holding <i>retail</i> deposits. For <i>margin call</i> and <i>no margin call</i> treatment see Section 3.5.2 <i>Prudential Support Obligations</i> for Physical Transactions. 			
Physical Transaction Prudential Support Obligation	Process P3	Process P8 and <i>Market Participants</i>	Periodic updates
<p>Description:</p> <ul style="list-style-type: none"> • Physical transaction <i>prudential support obligation – margin call</i> option: <ul style="list-style-type: none"> ○ <i>IESO</i>-assessed <i>minimum trading limit</i>; ○ <i>IESO</i>-assessed <i>default protection amount</i>; ○ <i>Maximum net exposure</i>; ○ Allowable reductions. • Physical transaction <i>prudential support obligation – No margin call</i> option: <ul style="list-style-type: none"> ○ <i>Maximum net exposure</i>; ○ Allowable reductions. • Valued in Canadian dollars (\$). • Required for communication to <i>market participants</i> and other downstream processes within the <i>IESO</i>. 			

6.1.4. Process P4 – Calculate Minimum Trading Limit and Default Protection Amounts for Virtual Transactions

Description

Process P4 utilizes data provided by *market participants* to calculate a *minimum trading limit* and *default protection amount* for virtual transactions employing decision rules described in Section 3.6.2 of this document.

This process only requires that portion of static data collected from Process P1 pertaining to participation in the DAM through virtual transactions.

This process utilizes the *market participant* submitted maximum daily *trading limit* for virtual transactions, and the *IESO* determined: day-ahead market to *real-time market price* delta, trading period assessment days, and virtual transaction uplift estimation rate.

Input and Output Data Flows

Table 6-4: Process P4 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Combined Static Data Stream 'C' Virtual Transactions	Process P1	Process P4	Periodic updates triggered by changes to PSO data collection
<p>Description:</p> <ul style="list-style-type: none"> • Portions of static data collected by Process P1 for use in the calculation of the <i>minimum trading limit</i> and <i>default protection amount</i> for virtual transactions activity. • This information includes: <ul style="list-style-type: none"> ○ Online <i>IESO</i> Authorization and Participation related forms data, ○ <i>Market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> (in MWh) for virtual transactions 			
Flow	Source	Target Processes	Frequency
Public Parameters Used to Support Virtual Transaction Minimum Trading Limit Calculation	Process P6	Process P4	Each <i>IESO</i> baseline and/or interim updates as required

<p>Description:</p> <ul style="list-style-type: none"> Public parameters required to calculate virtual transaction <i>minimum trading limit</i> (in dollars) for a given <i>market participant</i> including: <ul style="list-style-type: none"> <i>IESO</i> determined price delta ΔDAP_{VT}, $ARTP_{VT}$ <i>Trading limit</i> assessment period #Day_{STL} in calendar days for virtual transactions. <i>IESO</i> published uplift summary in \$/MWh 			
Flow	Source	Target Processes	Frequency
Virtual Transaction Minimum Trading Limit	Process P4	Process P5	Periodic updates triggered by changes to <i>market participant</i> data; virtual transaction price delta, assessment period days, uplift estimation rates.
<ul style="list-style-type: none"> <i>Minimum trading limit</i> (TL_{VT\$}) calculation: <ul style="list-style-type: none"> <i>Market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> (in MWh) for virtual transactions <i>IESO</i> determined price delta ΔDAP_{VT}, $ARTP_{VT}$ <i>Trading limit</i> assessment period in #Day_{STL} calendar days for virtual transactions Virtual transaction uplift estimation rate U_{VT} (in \$/MWh) All amounts in Canadian Dollars (\$). 			
Flow	Source	Target Processes	Frequency
Virtual Transaction Trading Limit	Process P1 and P4	Process P13	Updates triggered by changes to estimation rates or participant submitted data

<p>Description:</p> <ul style="list-style-type: none"> The <i>trading limit</i> for virtual transactions will be the <i>IESO-determined minimum trading limit</i> for virtual transactions based on the <i>market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> in MWh for virtual transactions. All amounts in Canadian dollars (\$). 			
Flow	Source	Target Processes	Frequency
Virtual Transaction Default Protection Amount	Process P4	Process P5	Periodic updates triggered by changes to estimation rates
<p>Description:</p> <ul style="list-style-type: none"> <i>Default protection amounts</i> ($DPA_{VT\\$}$) calculation: <ul style="list-style-type: none"> <i>Market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> (in MWh) for virtual transactions <i>IESO</i> determined price delta ΔDAP_{VT}, $ARTP_{VT}$ <i>Default protection amount</i> assessment period in $\#Days_{SDPA}$ calendar days for virtual transactions Virtual transaction uplift estimation rate U_{VT} (in \$/MWh). All amounts in Canadian Dollars (\$). 			

6.1.5. Process P5 – Calculate Prudential Support Obligation for Virtual Transactions

Description

Process P5 utilizes data provided by *market participants* and other *IESO* processes to determine the *prudential support obligation* for virtual transactions. The calculation of a *market participant's* virtual transactions *prudential support obligation* is the sum of the *IESO-determined minimum trading limit* and the *IESO-determined default protection amount* for virtual transactions.

Market participants that are considered net debtors will not be allowed any reductions to their *prudential support obligation* for virtual transactions. *Market participants* that qualify for net creditor status will be allowed reductions to their *prudential support obligation* for virtual transactions.

Input and Output Data Flows

Table 6-5: Process P5 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Virtual Transaction Prudential Support Obligation	Process P5	Process P8 and <i>Market Participants</i>	Periodic updates
<p>Description:</p> <ul style="list-style-type: none"> • <i>Prudential support obligation</i> for virtual transactions calculation: <ul style="list-style-type: none"> ○ Sum of the <i>market participant's</i> virtual transaction <i>minimum trading limit</i> and <i>default protection amount</i> ○ $PSO_{VT} = (TL_{VT\\$} + DPA_{VT\\$})$ • Valued in Canadian dollars. • Required for communication to <i>market participants</i> and other downstream processes within the <i>IESO</i>. 			

6.1.6. Process P6 – Maintain Rates and Parameters

Description

Process P6 has the primary responsibility to maintain a current and up-to-date list of all public parameters and estimation rates used to calculate a *market participant's prudential support obligation*. This data must be made available to both *market participants* and other sub-processes within the Prudential Security process in a timely manner.

The primary inputs to this process are not set out in the data flow diagram 6-1 but are from the following sources as amended for the future day-ahead and *real-time market*:

- *Market rule* provisions and any amendments there to;
- Policy decisions of the *IESO* as authorized by the *market rules*; and
- Policy decisions of the *IESO* Finance Department as authorized by the *market rules*.

Input and Output Data Flows

Table 6-6: Process P6 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Public Parameters Used to Calculate Prudential Support Obligation and Actual Exposure Calculation	Process P6	Process P2, Process P3, Process P4, Process P7, Process P10	Each IESO baseline and/or interim updates as required
<p>Description:</p> <ul style="list-style-type: none"> • To Process P2 (Calculate <i>minimum trading limit</i> and <i>default protection amount</i> for <i>physical transactions</i>): <ul style="list-style-type: none"> ○ IESO estimated day-ahead market to <i>real-time market price</i> deltas for LMP and Ontario Zonal prices; ○ IESO estimated rates applicable to “metered participants” for each type of <i>settlement amount</i>. • To Process P3 (MNE and <i>prudential support obligations</i> for <i>physical transactions</i>): <ul style="list-style-type: none"> ○ IESO-specified, allowable reductions for <i>market participant’s</i> credit rating; ○ Reductions for <i>market participant</i> good payment history ○ Allowable reductions for <i>distributors</i> holding <i>retail</i> deposits. • To Process P4 (Calculate <i>minimum trading limit</i> and <i>default protection amount</i> for virtual transactions) <ul style="list-style-type: none"> ○ IESO determined price delta ΔDAP_{VT}, $ARTP_{VT}$ ○ <i>Trading limit</i> assessment period #Days_{TL} in calendar days • To Process P11 via P10 (Calculate CNS component of <i>actual exposure</i> for physical transactions.) <ul style="list-style-type: none"> ○ Rate estimates for <i>settlement</i> uplifts and charges (reference) • To Process P12 via P10 (Calculate CNS component of <i>actual exposure</i> for virtual transactions.) <ul style="list-style-type: none"> ○ Virtual transaction DAM-RTM price deltas, and rate estimate for <i>settlement</i> virtual transaction uplift. • To Process P7 (<i>Publish</i> rates and parameters): <ul style="list-style-type: none"> ○ All rates and parameters maintained by Process P6. 			

6.1.7. Process P7 – Publish Rates and Parameters

Description

Process P7 involves the publication of parameters used by the *IESO* to calculate the *prudential support obligation* for:

1. physical transactions; and
2. virtual transactions

Such parameters allow *market participants* to determine the potential cost of their *prudential support obligation* for planning their trading activity.

Input and Output Data Flows

Table 6-7: Process P7 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Public Parameters Used to Calculate Prudential Support Obligation and Actual Exposure Calculation	Process P6	Process P7	Each <i>IESO</i> baseline and/or interim updates as required
<p>Description:</p> <ul style="list-style-type: none"> • Parameters <i>published</i> related to calculating <i>prudential support obligation</i> for physical transactions: <ul style="list-style-type: none"> ○ Public parameters used to calculate physical transaction <i>minimum trading limit</i> and <i>default protection amount</i>; ○ Public parameters used to calculate physical transaction <i>maximum net exposure</i> and <i>prudential support obligation</i>; ○ Public parameters used to support calculation of CNS component of <i>actual exposure</i> for physical transactions. • Parameters related to calculating the <i>prudential support obligation</i> for virtual transactions: <ul style="list-style-type: none"> ○ Public parameters used to calculate virtual transaction <i>minimum trading limit</i> and <i>default protection amount</i>; ○ Public parameters used to support calculation of CNS component of <i>actual exposure</i> for virtual transactions. 			

Flow	Source	Target Processes	Frequency
Public Parameters Used to Calculate Prudential Support Obligation	Process P7	Publication <i>Market Manuals</i> Guide to Prudentials	Each <i>IESO</i> baseline and/or interim updates as required
<p>Description:</p> <ul style="list-style-type: none"> • Pass-through of all parameters received from Process P6. • Routed to: <ul style="list-style-type: none"> ○ <i>IESO</i> public website; and/or ○ <i>Market manuals</i> as applicable; and/or ○ Guide to Prudentials 			

6.1.8. Process P8 – Collect Prudential Support and Related Documentation

Description

Process P8 is the primary interface between the *IESO* Prudential Security process and *market participants* for the collection of all *prudential support* for both:

- physical transactions; and
- virtual transactions.

The primary inputs into this process are the *prudential support obligation* dollar amounts from upstream processes P3 and P5 and the *prudential support* actually received from *market participants*. Receipt of *prudential support* is then conveyed to other *IESO* Prudential Security process sub-processes for further assessment.

Input and Output Data Flows

Table 6-8: Process P8 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Physical Transaction Prudential Support Obligation	Process P3	Process P8 and <i>Market Participants</i>	Periodic updates

<p>Description:</p> <ul style="list-style-type: none"> • The <i>prudential support obligation</i> for <i>physical transactions</i>. • Valued in Canadian dollars (\$). • Required for reconciliation against physical transaction <i>prudential support</i> actually received by the <i>IESO</i>. 			
Flow	Source	Target Processes	Frequency
Virtual Transaction Prudential Support Obligation	Process P5	Process P8; <i>Market Participants</i>	Periodic updates
<p>Description:</p> <ul style="list-style-type: none"> • The <i>prudential support obligation</i> for virtual transactions for an authorized <i>market participant</i>. • Valued in Canadian dollars (\$). • Required for reconciliation against virtual transaction <i>prudential support</i> actually received by the <i>IESO</i>. 			
Flow	Source	Target Processes	Frequency
Confirmation of Prudential Support Received	Process P8	Authorization and Participation process	Completes every application for authorization in the DAM and/or <i>real-time markets</i>
<p>Description:</p> <ul style="list-style-type: none"> • This data flow matches a Request for Authorization received by Process P1 to the <i>prudential support</i> received by a <i>market participant</i> for a specific set of trading privileges in the DAM and/or <i>real-time market</i>. A set of trading privileges may consist of one or more of the following: <ul style="list-style-type: none"> ○ A <i>market participant</i> request for authorization to participate in the <i>real-time market</i> as a <i>metered market participant</i> for a <i>non-dispatchable load</i> or an LDC; and/or ○ A <i>market participant</i> request for authorization to participate in the DAM and/or <i>real-time market</i> as a registered <i>market participant</i> for a dispatchable <i>generation facility</i>, <i>dispatchable load</i>, or price responsive load; and/or 			

- A *market participant* request for authorization to participate in the DAM and *real-time market* engaging in physical import or export transactions at the interties; and/or
- A *market participant* request for authorization to participate in the DAM engaging in virtual transactions.

This data flow confirms that the *prudential support* corresponding to the above request has indeed been received by the Process P8.

Flow	Source	Target Processes	Frequency
Prudential Support	<i>Market Participants</i>	Process P8	Corresponds to new or updates to any type of <i>prudential support</i>

Description:

- *Prudential support* matched to the applicable *prudential support obligation*.
- Physical Transaction *Prudential Support*:
 - Irrevocable commercial letter of credit; and/or
 - Third-party guarantee; and/or
 - Canadian government treasury bills; and/or
 - *Affiliate* guarantee.
- Virtual Transaction *Prudential Support*:
 - Irrevocable commercial letter of credit.
 - Net creditor status reduction.

Flow	Source	Target Processes	Frequency
Related Prudential Support Documentation	<i>Market Participants</i>	Process P9	Every time new documentation is received from <i>market participant</i>

Description:

- Supporting documentation for any type of *prudential support* annotated with any corrections/observations from Process P8.
- Allows Process P9 to monitor the quality of *prudential support* for such things as expiration dates or the credit rating of a guarantor.

Flow	Source	Target Processes	Frequency
Reassessment Decisions	Process P9	Process P8	Every time a type of <i>prudential support</i> expires or otherwise becomes deficient
<p>Description:</p> <ul style="list-style-type: none"> Notification/trigger to Process P8 that some or all of a <i>market participant's prudential support</i> needs to be updated or supplemented due to: <ul style="list-style-type: none"> A change in an organization's ability to be guarantor as per the <i>market rules</i>; and/or The expiration of a guarantee; and/or A change in a <i>market participant's</i> credit rating; and/or The guarantor is a <i>market participant</i> and has subsequently sought a reduction in its own <i>prudential support</i> under the provisions of Chapter 2, Section 5.8 of the <i>market rules</i>. 			
Flow	Source	Target Processes	Frequency
Notice of Prudential Support Reassessment	Process P8	<i>Market Participant</i>	Every time a type of <i>prudential support</i> expires or otherwise becomes deficient
<p>Description:</p> <ul style="list-style-type: none"> Formal conveyance of a Reassessment Decision from Process P8 to the <i>market participant</i>. Describes the reason(s) for the Reassessment and the amount and nature of additional <i>prudential support</i> required from the <i>market participant</i>. 			

6.1.9. Process P9 – Monitor Quality of Physical Transaction Prudential Support

Description

Process P9 monitors the quality and applicability of any *prudential support* received from *market participants* on an ongoing basis. The *market rules* may require a *market participant* to post more *prudential support* with the *IESO* under any of the following circumstances:

- A change in an organization's ability to be guarantor as per the *market rules*; and/or
- The expiration of a guarantee; and/or
- A change in a *market participant's* credit rating; and/or
- The guarantor is a *market participant* and has subsequently sought a reduction in its own *prudential support* under the provisions of *Market Rules*; and/or
- In the case of virtual transactions, consideration of a *market participant's* overall *market creditor* status in physical transaction/*real-time market* activity.

Input and Output Data Flows

Table 6-9: Process P9 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Credit Ratings	Credit Rating Agencies	Process P9	As credit ratings change
<p>Description:</p> <ul style="list-style-type: none"> • Includes credit ratings for: <ul style="list-style-type: none"> ○ <i>Market participants</i> providing <i>prudential support</i> who have received a reduction in their <i>prudential support obligation</i> on the merits of their credit rating; and/or ○ Guarantors of <i>prudential support</i> provided by a <i>market participant</i>. 			
<i>Prudential Support</i> and Related Documentation	<i>Market Participants</i> via Process P8	Process P9	Every time new documentation is received from <i>market participant</i>
<p>Description:</p> <ul style="list-style-type: none"> • Supporting documentation for any type of <i>prudential support</i> annotated with any corrections/observations from Process P8. • Includes such information as: <ul style="list-style-type: none"> ○ Allowances given to <i>market participants</i> for reductions in their <i>prudential support obligation</i> due to credit ratings; ○ Identity of guarantors; and ○ Expiration dates of letters of credit. 			

Flow	Source	Target Processes	Frequency
Reassessment Decisions	Process P9	Process P8	Every time a type of <i>prudential support</i> expires or otherwise becomes deficient
<p>Description:</p> <ul style="list-style-type: none"> Notification/trigger to Process P8 that some or all of a <i>market participant's prudential support</i> needs to be updated or supplemented due to: <ul style="list-style-type: none"> A change in an organization's ability to be guarantor as per the <i>market rules</i>; and/or The expiration of a guarantee; and/or A change in a <i>market participant's</i> credit rating; and/or The guarantor is a <i>market participant</i> and has subsequently sought a reduction in its own <i>prudential support</i> under the provisions of the <i>market rules</i>; and/or In the case of virtual transaction <i>prudential support</i>, the <i>market participant's</i> status as a net <i>market creditor</i> in the <i>physical market</i> has changed. 			

6.1.10. Process P10 – AE Data Collection

Description

Process P10 collects dynamic data related to *actual exposure* from various *IESO* processes outside of the Prudential Security process. Such data is then made available to downstream sub-processes within the Prudential *Security* process in the areas of *actual exposure* (AE) calculation and *margin call* administration.

Input and Output Data Flows

Table 6-10: Process P10 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
DAM Prices and Quantities for "Dispatchable Market Participants"	DAM Calculation Engine	Process P10	Daily

<p>Description:</p> <ul style="list-style-type: none"> Day-ahead <i>market prices</i> and quantities from the DAM calculation engine for dispatchable <i>generation facilities, dispatchable loads, boundary entity</i> import and export transactions, and price responsive loads. <ul style="list-style-type: none"> Hourly day-ahead LMP for <i>energy</i> and <i>operating reserve</i>; and Hourly day-ahead scheduled quantities of <i>energy</i> and <i>operating reserve</i>. Initial <i>settlement</i> ready day-ahead LMP prices anticipated at <i>dispatch day -1</i> calendar day. Data input to the calculation of the CNS component of estimated <i>actual exposure</i> for physical transactions. <p>NOTE: Hourly day-ahead LMP for dispatchable <i>generation facility, dispatchable load, and boundary entity</i>, and price responsive load <i>delivery points</i> will be retained for historical purposes.</p>			
Flow	Source	Target Processes	Frequency
DAM Prices and Quantities for "Non-dispatchable Market Participants"	DAM Calculation Engine	Process P10	Daily
<p>Description:</p> <ul style="list-style-type: none"> Day-ahead <i>market prices</i> and quantities from the DAM calculation engine for <i>non-dispatchable loads</i> and local distribution companies (LDCs). <ul style="list-style-type: none"> Hourly day-ahead Ontario Zonal Price (OZP). Initial <i>settlement</i> ready day-ahead OZP anticipated at <i>dispatch day -1</i>. Data input to the calculation of the CNS component of estimated <i>actual exposure</i> for physical transactions. <p>NOTE: Hourly day-ahead LMP for <i>non-dispatchable load delivery points</i> will be retained for historical purposes.</p>			
Flow	Source	Target Processes	Frequency
DAM Prices and Quantities for Virtual Transactions	DAM Calculation Engine	Process P10	Daily

- Day-ahead *market prices* and quantities from the DAM Calculation Engine for virtual zonal trading entities.
 - Hourly day-ahead virtual zonal *energy prices*; and
 - *Market participant* day-ahead virtual transaction buy and sell day-ahead market schedule quantities.
- Initial *settlement* ready day-ahead virtual zonal *energy prices* anticipated at *dispatch day -1* calendar day.
- Data input to the calculation of the CNS component of estimated *actual exposure* for virtual transactions.

NOTE: Hourly day-ahead virtual zonal *energy prices* will be retained for historical purposes.

Flow	Source	Target Processes	Frequency
RTM Prices and Quantities	RT Calculation Engine	Process P10	Daily

Description:

- *Real-time market prices* and *scheduled* quantities from the RT calculation engine for dispatchable *generation facilities, dispatchable loads, boundary entity* import and export transactions.
 - Hourly real-time LMP for *energy* and *operating reserve*; and
 - Hourly real-time virtual zonal *energy prices*; and
 - Hourly real-time scheduled quantity of *energy* and *operating reserve*.
- Initial *settlement* ready real-time LMP prices and virtual zonal *energy prices* anticipated at *dispatch day +1* calendar day.
- Data input to the calculation of the CNS component of estimated *actual exposure* for physical transactions and virtual transactions.

NOTE: Hourly real-time LMP for all dispatchable and non-dispatchable generation and load *delivery points* will be retained for historical purposes.

NOTE: Hourly real-time virtual zonal *energy prices* will be retained for historical purposes.

Flow	Source	Target Processes	Frequency
Actual Quantity of Energy Withdrawn or Injected	<i>Metering Process</i>	Process P10	Real time

<p>Description:</p> <ul style="list-style-type: none"> Adjusted and totalized sum of <i>metering data</i> for all <i>delivery points</i> associated with <i>registered facilities</i> with a <i>registered wholesale meter (RWM)</i>, including: <ul style="list-style-type: none"> AOEW: Allocated Quantity of <i>Energy Withdrawn</i> (i.e., the <i>facility's</i> actual metered withdrawal of <i>energy</i>); and AOEI: Allocated Quantity of <i>Energy Injected</i> (i.e., the <i>facility's</i> actual metered injection of <i>energy</i>). First adjusted and totalized <i>delivery point</i> data anticipated at <i>dispatch day</i> +1 calendar day. Data input to the calculation of the CNS component of estimated <i>actual exposure</i> for "dispatchable <i>market participants</i>" and "non-dispatchable <i>market participants</i>". 			
Flow	Source	Target Processes	Frequency
Settlement amounts	<i>Settlement process</i>	Process P10	DAM and real-time <i>settlement cycles</i>
<p>Description:</p> <ul style="list-style-type: none"> <i>Settlement amount</i> data produced on a <i>business day</i> cycle, including: <ul style="list-style-type: none"> <i>Preliminary settlement statement</i> data (physical transactions and virtual transactions); and <i>Final settlement statement</i> data (physical transactions and virtual transactions). First <i>preliminary settlement statement</i> internal production anticipated at <i>dispatch day</i> +6 <i>calendar days</i>. First final <i>settlement statement</i> internal production anticipated at <i>dispatch day</i> +18 <i>business days</i>. Used to calculate the Settled-but-Not-Invoiced (SNI) component of <i>actual exposure</i> for physical transactions and virtual transactions. <p>NOTE: Statement for last trade date of the month will include actual monthly charges under Settled-but-Not-Invoice (SNI) component which were previously estimated on a daily basis as part of the estimated <i>actual exposure</i> calculation. To avoid duplication, these charges will be removed from the estimated <i>actual exposure</i> calculation except from the Settled-but-Not-Invoice (SNI) component.</p>			
Flow	Source	Target Processes	Frequency
Payments	Market Invoicing and Payments	Process P10	Dynamically updated with Payments &

			Prepayments to the <i>IESO</i> clearing account
<p>Description:</p> <ul style="list-style-type: none"> Information confirming voluntary prepayments, and <i>margin call</i> payments. <ul style="list-style-type: none"> Voluntary prepayment; Prepayment refunds; and <i>Margin call</i> payments. Used by downstream processes to confirm compliance with <i>margin calls</i> and adjustment of <i>actual exposure</i>. 			
Flow	Source	Target Processes	Frequency
Public Parameters Used to Support Actual Exposure Calculation	Process P6	Process P11 and P12	Each <i>IESO</i> baseline and/or interim updates as required
<p>Description:</p> <ul style="list-style-type: none"> Provision of <i>published</i> parameters used to calculate CNS component of <i>actual exposure</i> calculations. Includes: <ul style="list-style-type: none"> Rate estimates for <i>settlement</i> uplifts and charges for physical transactions; Virtual transaction DAM-RTM price deltas; and Rate estimate for <i>settlement</i> virtual transaction uplift. 			
Flow	Source	Target Processes	Frequency
Combined Dynamic Data Stream 'A' Physical Transactions	Process P10	Process P11	Daily
<p>Description:</p> <ul style="list-style-type: none"> Provision of all necessary data to Process P11 to calculate <i>actual exposure</i> for physical transactions in the day-ahead market and <i>real-time market</i>. Includes: <ul style="list-style-type: none"> Rate estimates for <i>settlement</i> uplifts and charges for physical transactions; 			

<ul style="list-style-type: none"> ○ Hourly day-ahead LMP for <i>energy</i> and <i>operating reserve</i>; ○ Hourly day-ahead scheduled quantities of <i>energy</i> and <i>operating reserve</i>; ○ Hourly day-ahead Ontario Zonal Price (OZP); ○ Hourly real-time LMP for <i>energy</i> and <i>operating reserve</i>; ○ Hourly real-time scheduled quantity of <i>energy</i> and <i>operating reserve</i>; ○ AQEW: Allocated Quantity of <i>Energy</i> Withdrawn; ○ AQEI: Allocated Quantity of <i>Energy</i> Injected; ○ <i>Preliminary settlement statement</i> data; ○ <i>Final settlement statement</i> data; and ○ Prepayment data. 			
Flow	Source	Target Processes	Frequency
Combined Dynamic Data Stream 'B' Virtual Transactions	Process P10	Process P12	Daily
<p>Description:</p> <ul style="list-style-type: none"> • Provision of all necessary data to Process P12 to calculate <i>actual exposure</i> for virtual transactions. • Includes: <ul style="list-style-type: none"> ○ Virtual transaction DAM-RTM price deltas; ○ Rate estimate for <i>settlement</i> virtual transaction uplift; ○ Hourly day-ahead virtual transaction zonal trading entity <i>energy</i> prices; ○ <i>Market participant</i> day-ahead virtual transaction buy and sell day-ahead market schedule quantities; ○ Hourly real-time virtual transaction zonal trading entity <i>energy</i> prices; and ○ Prepayment data. 			
Flow	Source	Target Processes	Frequency
Voluntary Prepayments/Margin Call Payments	Process P10	Process P16	Daily
<p>Description:</p> <ul style="list-style-type: none"> • Provision of all necessary data to Process P16 to confirm receipt of margin payments for both physical transactions and virtual transactions. 			

- Includes:
 - *Margin call* payments; and
 - Voluntary prepayments.

6.1.11. Process P11 – Calculate Actual Exposure for Physical Transactions

Description

Process P11 comprise the *IESO's* calculations that form a reasonable estimate of a *market participant's actual exposure* (AE-P) on a daily basis during each *billing period*. The daily monitoring of *actual exposure* consists of two calculations, namely:

- CNS – the cleared-but-not settled component estimating the *actual exposure* between the time of the clearing of the day-ahead market and the clearing of *real-time market* and the time of the production of *settlement amounts* included on the *preliminary settlement statements* and *final settlement statements* for each *market participant*.
- SNI – settled-but-not-invoiced component replacing estimated CNS values with actual *settlement amounts* for each *dispatch day* produced by the *settlement process* for each *market participant*. The SNI component also replaces any amounts from the other *settlement amounts* component.

A *market participant's actual exposure* will be reduced by voluntary prepayments and *margin call* payments received by the *IESO*. Voluntary prepayments and *margin call* payments received by the *IESO* will not be differentiated between physical transactions and virtual transactions.

The components of the AE-P calculations carried out by this process are described in Section 3.5.5.

Input and Output Data Flows

Table 6-11: Process P11 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Combined Dynamic Data Stream 'A' Physical Transactions	Process P10	Process P11	Daily

<p>Description:</p> <ul style="list-style-type: none"> • Provision of all necessary data from Process P10 to calculate <i>actual exposure</i> for physical transactions in the day-ahead market and <i>real-time market</i>. • Includes: <ul style="list-style-type: none"> ○ Rate estimates for <i>settlement</i> uplifts and charges for physical transactions; ○ Hourly day-ahead LMP for <i>energy</i> and <i>operating reserve</i>; ○ Hourly day-ahead scheduled quantities of <i>energy</i> and <i>operating reserve</i>; ○ Hourly day-ahead Ontario Zonal Price (OZP); ○ Hourly real-time LMP for <i>energy</i> and <i>operating reserve</i>; ○ Hourly real-time scheduled quantity of <i>energy</i> and <i>operating reserve</i>; ○ AQEW: Allocated Quantity of <i>Energy</i> Withdrawn; ○ AQEI: Allocated Quantity of <i>Energy</i> Injected; ○ <i>Preliminary settlement statement</i> data; and ○ <i>Final settlement statement</i> data. ○ Prepayment data 			
Flow	Source	Target Processes	Frequency
CNS Calculation Physical Transactions "Dispatchable Market Participants"	Process P10	Process P11	Daily
<p>Description:</p> <ul style="list-style-type: none"> • "Dispatchable market participants" are <i>market participants</i> with financial obligations for physical transactions arising from the supply or consumption of <i>energy</i> or <i>operating reserve</i> for: <ul style="list-style-type: none"> ○ Dispatchable <i>generation facilities</i>; ○ <i>Dispatchable loads</i>; ○ Boundary entity import and export transactions; and ○ Price responsive loads. • The CNS calculation for "dispatchable market participants" will be updated on a daily basis using the day-ahead market and <i>real-time market</i> quantity and prices including: <ul style="list-style-type: none"> ○ Hourly day-ahead LMP for <i>energy</i> and <i>operating reserve</i>; ○ Hourly day-ahead scheduled quantities of <i>energy</i> and <i>operating reserve</i>; ○ Hourly real-time LMP for <i>energy</i> and <i>operating reserve</i>; 			

<ul style="list-style-type: none"> ○ Hourly real-time scheduled quantity of <i>energy</i> and <i>operating reserve</i>; ○ AQEW: Allocated Quantity of <i>Energy</i> Withdrawn; and ○ AQEI: Allocated Quantity of <i>Energy</i> Injected. 			
Flow	Source	Target Processes	Frequency
CNS Calculation Physical Transactions "Non-dispatchable Market Participants"	Process P10	Process P11	Daily
<p>Description:</p> <ul style="list-style-type: none"> • "Non-dispatchable market participants" are <i>market participants</i> with financial obligations for market transactions arising from the consumption of <i>energy</i> for <i>non-dispatchable loads</i> and LDCs. • The CNS calculation for "non-dispatchable market participants" will be updated on a daily basis using the day-ahead market Ontario Zonal Price and actual <i>energy</i> withdrawals: <ul style="list-style-type: none"> ○ Hourly day-ahead Ontario Zonal Price (OZP) not including <i>settlement</i> forecast deviation price adjustments; and ○ AQEW: Allocated Quantity of <i>Energy</i> Withdrawn for each <i>delivery point</i> for <i>non-dispatchable loads</i>. 			
Flow	Source	Target Processes	Frequency
Actual Exposure Calculation Other Settlement Amounts	Process P6	Process P11	Each <i>IESO</i> baseline and/or interim updates as required
<p>Description:</p> <ul style="list-style-type: none"> • Other <i>settlement amount</i> estimations for "dispatchable <i>market participants</i>" and non-dispatchable <i>market participants</i>: <ul style="list-style-type: none"> ○ Estimated costs of <i>settlement</i> uplifts and charges. • <i>Actual exposure</i> estimates for other <i>settlement amounts</i> will be extracted as these estimates are replaced by SNI <i>settlement amounts</i>. 			
SNI Calculation Physical Transactions	Process P10	Process P11	Daily

<p>Description:</p> <ul style="list-style-type: none"> The calculation of the SNI settled-but-not-invoiced component of <i>actual exposure</i> will use <i>settlement</i> data from Process P10 to calculate <i>actual exposure</i> for physical transactions in the day-ahead market and <i>real-time market</i> for "dispatchable <i>market participants</i>" and "non-dispatchable <i>market participants</i>". Includes <i>settlement amounts</i> for each <i>dispatch day</i> from: <ul style="list-style-type: none"> Preliminary <i>settlement statement</i> data; and Final <i>settlement statement</i> data. Actual <i>settlement amounts</i> from <i>preliminary settlement statements</i> and subsequent <i>final settlement statements</i> will replace CNS estimates for <i>settlement amounts</i> for each <i>dispatch day</i> as the <i>settlement statements</i> are produced. In addition to replacing CNS estimates, monthly charges will replace other <i>settlement amounts</i> calculated as part of daily <i>actual exposure</i> calculations. 			
Flow	Source	Target Processes	Frequency
Prepayments	Market Invoicing and Payments	Process P11 and P12	Dynamically updated with Payments & Prepayments to the IESO clearing account
<p>Description:</p> <ul style="list-style-type: none"> Voluntary prepayment and <i>margin call</i> payment when received by the IESO will be applied to reduce the calculated <i>actual exposure</i> during a <i>billing period</i> for each <i>market participant</i>. Includes: <ul style="list-style-type: none"> Voluntary prepayments; Prepayment refunds; and <i>Margin call</i> payments. 			
Flow	Source	Target Processes	Frequency

Physical Transaction AE-P	Process P11	Process P13	Daily
<p>Description:</p> <ul style="list-style-type: none"> • Combined <i>actual exposure</i> calculation for physical transactions in the day-ahead market and <i>real-time market</i>. <ul style="list-style-type: none"> ○ Cumulative CNS estimated <i>actual exposure</i> for physical transactions in the day-ahead market and <i>real-time market</i> for each <i>dispatch day</i> in a <i>billing period</i> that has not yet been incorporated into the <i>settlement process</i>; ○ Cumulative other <i>settlement amounts</i> for physical transactions estimated each <i>dispatch day</i>; ○ Replaced by actual <i>settlement amounts</i> for each <i>dispatch day</i> in a <i>billing period</i> calculated by the preliminary <i>settlement statement</i> process; ○ Updated by <i>settlement amounts</i> for each <i>dispatch day</i> in a <i>billing period</i> calculated by the final <i>settlement statement</i> process; and ○ Adjusted for voluntary prepayments and <i>margin call</i> payments received by the <i>IESO</i> during the <i>billing period</i>. 			

6.1.12. Process P12 – Calculate Actual Exposure for Virtual Transactions

Description

Virtual transaction *actual exposure* (AE-V) is defined as the sum of all financially unsettled and settled day-ahead market positions attributable to a *market participant's* virtual transactions net of any prepayments made after the issuance of the previous month's *invoice* and up to one *business day* prior to the issuance of the current month's *invoice*. The *market participant's* virtual transactions would be accrued from the start of a given *billing period* up to and including two *business days* prior to *invoice* issuance.

Process P12 comprise the *IESO's* calculations that form a reasonable estimate of a *market participant's actual exposure* (AE-V) on a daily basis during each *billing period*. The daily monitoring of *actual exposure* consists of two calculations, namely:

- CNS – the cleared-but-not settled component will be the sum of virtual transaction *bids* and *offers* for the past six rolling days that have cleared the day-ahead market and *real-time market* but have not yet been settled. The CNS component is further broken down into:
 - CNS_{DAM} based on virtual transaction day-ahead market schedules and *IESO*-determined virtual zonal *energy* price deltas, and

- CNS_{RTM} based on virtual transaction day-ahead market schedules and the difference between actual day-ahead hourly virtual zonal *energy* prices and the real-time virtual zonal *energy* prices.
- SNI – settled-but-not-invoiced component replacing estimated CNS values with actual *settlement amounts* for each *dispatch day* produced by the *settlement process* for each *market participant*, including any associated day-ahead market *reliability* unit commitment uplift.

A *market participant's actual exposure* will be reduced by voluntary prepayments and *margin call* payments received by the *IESO*. Voluntary prepayments and *margin call* payments received by the *IESO* will not be differentiated between physical transactions and virtual transactions.

The components of the AE-V calculation for virtual transactions are described in Section 3.6.5.

Input and Output Data Flows

Table 6-12: Process P12 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Combined Dynamic Data Stream 'B' Virtual Transactions	Process P10	Process P12	Daily
<p>Description:</p> <ul style="list-style-type: none"> • Provision of all necessary data from Process P10 to calculate <i>actual exposure</i> for virtual transactions in the day-ahead market including: <ul style="list-style-type: none"> • Day-ahead <i>market prices</i> and quantities from the DAM Calculation Engine for virtual zonal trading entities. <ul style="list-style-type: none"> ○ Hourly day-ahead virtual transaction zonal trading entity <i>energy</i> prices; and ○ <i>Market participant</i> day-ahead virtual transaction buy and sell market schedule quantities. • <i>Real-time market prices</i> from the RT Calculation Engine for virtual zonal trading entities. <ul style="list-style-type: none"> ○ Hourly real-time virtual transaction zonal trading entity <i>energy</i> prices. • Public parameters used to support virtual transaction CNS_{DAM} calculation. <ul style="list-style-type: none"> ○ <i>IESO</i> determined price delta ΔDAP_{VT}, $ARTP_{VT}$; and ○ U_{VT} = the virtual transaction uplift estimation rate in \$/MWh. 			

<ul style="list-style-type: none"> Prepayment data 			
Flow	Source	Target Processes	Frequency
CNS Calculation Virtual Transactions CNS _{DAM} Calculation	Process P10	Process P12	Daily
<p>Description:</p> <ul style="list-style-type: none"> The CNS calculation for virtual transactions will be updated on a daily basis using virtual day-ahead market quantities scheduled for sale or purchase and the <i>IESO</i>-determined virtual transaction zonal trading entity <i>energy</i> price deltas for the period of time that virtual transaction zonal trading entity <i>energy</i> prices are not yet available from the <i>real-time market</i>. The CNS_{DAM} calculation will use the following data: <ul style="list-style-type: none"> $DAM_QVSI_{m,h}$ the virtual transaction quantity scheduled for injection or sale in the day-ahead market; and $DAM_QVSW_{m,h}$ the <i>virtual transaction</i> quantity scheduled for withdrawal or purchase in the day-ahead market; and $\Delta DAP_{VT,m,h} / ARTP_{VT,m,h}$ is the <i>IESO</i>-determined price delta for each virtual transaction zonal trading entity; U_{VT} = the virtual transaction uplift estimation rate, in \$/MWh. 			
Flow	Source	Target Processes	Frequency
CNS Calculation Virtual Transactions CNS _{RTM} Calculation	Process P10	Process P12	Daily
<p>Description:</p> <ul style="list-style-type: none"> The CNS calculation for virtual transactions will be updated on a daily basis using virtual day-ahead market quantities scheduled for sale or purchase as well as the <i>IESO</i>-determined virtual transaction zonal trading entity <i>energy</i> price deltas. These price deltas will be based on the virtual transaction zonal trading entity <i>energy</i> prices from the day-ahead market and the <i>real-time market</i> The CNS_{RTM} calculation will use the following data: <ul style="list-style-type: none"> $DAM_QVSI_{m,h}$ is the virtual transaction quantity scheduled for injection or sale in the day-ahead market; 			

<ul style="list-style-type: none"> ○ $DAM_QVSW_{m,h}$ is the <i>virtual transaction</i> quantity scheduled for withdrawal or purchase in the day-ahead market; ○ $\Delta DAP_{VT,m,h} \cdot ARTP_{VT,m,h}$ is the <i>IESO-determined price delta</i> for each virtual transaction zonal trading entity; and ○ <i>UVT</i> is the virtual transaction uplift estimation rate, in \$/MWh. 			
Flow	Source	Target Processes	Frequency
SNI Calculation Virtual Transactions	Process P10	Process P12	Daily
<p>Description:</p> <ul style="list-style-type: none"> • The calculation of the SNI settled-but-not-invoiced component of <i>actual exposure</i> will use <i>settlement</i> data from Process P10 to calculate <i>actual exposure</i> for virtual transactions in the day-ahead market and <i>real-time market</i>. • Includes <i>settlement amounts</i> for each <i>dispatch day</i> from: <ul style="list-style-type: none"> ○ preliminary <i>settlement statement</i> data; and ○ final <i>settlement statement</i> data. • Actual <i>settlement amounts</i> from <i>preliminary settlement statements</i> and subsequent <i>final settlement statements</i> will replace CNS estimates for <i>settlement amounts</i> for each <i>dispatch day</i> as the <i>settlement statements</i> are produced. 			
Flow	Source	Target Processes	Frequency
Prepayments	Market Invoicing and Payments	Process P11 and P12	Dynamically updated with Payments & Prepayments to the <i>IESO</i> clearing account
<p>Description:</p> <ul style="list-style-type: none"> • Voluntary prepayment and <i>margin call</i> payment when received by the <i>IESO</i> will be applied to reduce the calculated <i>actual exposure</i> during a <i>billing period</i> for each <i>market participant</i>. • Includes: <ul style="list-style-type: none"> ○ Voluntary prepayments; ○ Prepayment refunds; and ○ <i>Margin call</i> payments. 			

Flow	Source	Target Processes	Frequency
Virtual Transaction AE-V	Process P12	Process P13 and P16	Daily
<p>Description:</p> <ul style="list-style-type: none"> • <i>Actual exposure</i> calculation AE-V for virtual transactions in the day-ahead market up to and including two <i>business days</i> prior to <i>invoice</i> issuance. <ul style="list-style-type: none"> ○ Cumulative CNS estimated <i>actual exposure</i> for physical transactions in the day-ahead market for each <i>dispatch day</i> in a <i>billing period</i> that has not yet been incorporated into the <i>settlement process</i>. ○ Replaced by actual <i>settlement amounts</i> for each <i>dispatch day</i> in a <i>billing period</i> calculated by the <i>preliminary settlement statement</i> process. ○ Updated by <i>settlement amounts</i> for each <i>dispatch day</i> in a <i>billing period</i> calculated by the <i>final settlement statement</i> process. ○ Adjusted for voluntary prepayments and <i>margin call</i> payments received by the <i>IESO</i> during the <i>billing period</i> net of any prepayments received one <i>business day</i> prior to <i>invoice</i> issuance. 			

6.1.13. Process P13 – Assess Margin Levels for Physical and Virtual Transactions

Description

Process P13 evaluates *actual exposure* (AE) levels for physical transactions and virtual transactions. These two types of AE results are provided to Process P13 by upstream processes P11 and P12 and are compared against their respective *trading limits* established in processes P2 and P4. This assessment is done on a daily basis and on an ad hoc basis in the event of a material change in a *market participant's prudential support*.

Input and Output Data Flows

Table 6-13: Process P13 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Physical Transaction AE-P	Process P11	Process P13	Daily

<p>Description:</p> <ul style="list-style-type: none"> • Combined calculated <i>actual exposure</i> AE-P for physical transactions in the day-ahead market and/or <i>real-time market</i>. • Single value for each applicable <i>market participant</i> in Canadian dollars. 			
Flow	Source	Target Processes	Frequency
Virtual Transaction AE-V	Process P12	Process P13	Daily
<p>Description:</p> <ul style="list-style-type: none"> • Calculated <i>actual exposure</i> AE-V for virtual transactions in the day-ahead market. • Single value for each applicable <i>market participant</i> in Canadian dollars. 			
Flow	Source	Target Processes	Frequency
Trading Limit Margin Physical Transactions	Process P2 and P13	Process P15	Daily
<p>Description:</p> <ul style="list-style-type: none"> • The available <i>trading limit</i> margin for physical transactions will be calculated daily based on the <i>market participant's</i> established <i>trading limit</i> reduced by the daily calculation of <i>actual exposure</i> (AE-P) for physical transactions. Calculation includes: <ul style="list-style-type: none"> ◦ Physical transaction <i>trading limit</i> for each <i>market participant</i>; and ◦ Calculated physical transaction <i>actual exposure</i> (AE-P) for each <i>market participant</i>. • Single value for physical transactions for each applicable <i>market participant</i> in Canadian dollars. 			
Flow	Source	Target Processes	Frequency
Trading Limit Margin Virtual Transactions	Process P4 and P13	Process P14 and P15	Daily
<p>Description:</p> <ul style="list-style-type: none"> • The available <i>trading limit</i> margin for virtual transactions will be calculated daily based on the <i>market participant's</i> established <i>trading limit</i> reduced by the daily calculation of <i>actual exposure</i> (AE-V) for virtual transactions. Calculation includes: <ul style="list-style-type: none"> ◦ Virtual transaction <i>trading limit</i> for each <i>market participant</i>; and 			

<ul style="list-style-type: none"> ○ Calculated virtual transaction <i>actual exposure</i> (AE-V) for each <i>market participant</i>. • Single value for virtual transactions for each applicable <i>market participant</i> in Canadian dollars. 			
Flow	Source	Target Processes	Frequency
Physical and Virtual Transaction Margin Warning and Margin Call Triggers	Process P13	Process P15	Daily and in the event of a material change in <i>prudential support</i> provided
<p>Description:</p> <ul style="list-style-type: none"> • This data flow separately identifies situations in which a <i>market participant's</i> computed combined AE value inclusive of both physical and virtual transactional activity has exceeded the margin warning or <i>margin call</i> threshold for physical transaction and/or virtual transaction activity. • This data flow contains: <ul style="list-style-type: none"> ○ The identity of the <i>market participant</i>; ○ The amount of the margin payment required; ○ Indication if the trigger is for a <i>margin call</i> or a margin warning; and ○ The type of activity (physical, virtual) to which that it pertains. • Not applicable to physical transactions where the <i>market participant</i> has selected the <i>no margin call option</i>. 			

6.1.14. Process P14 – Virtual Transaction Bid/Offer Screens

Description

Process P14 provides screening of virtual transaction *bids* and *offers* as this *dispatch data* is submitted through the participant *Energy Market Interface*. Two screening methods will be employed. The first will validate the absolute value of the MWh sum of all current *bid* and *offer* quantities against the *market participant* supplied absolute value of the maximum daily *trading limit* in MWh. The second will validate the absolute value of the sum of all current *bids* and *offers* in dollars against the *IESO*-determined virtual transaction *trading limit* margin in dollars. Virtual transaction *bids* or *offers* submitted prior to the close of the day-ahead market bidding window will be rejected if either of these validations fail and such failed *bids* or *offers* will not be processed through to the DAM calculation engine. The *market participant* will receive a rejection message for any *bid* or *offer* failing

either of these validations up until the close of the bidding window for the day-ahead market.

The screening rules for virtual transaction *bids* and *offers* are described in Section 3.6.5.

Input and Output Data Flows

Table 6-14: Process P14 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Virtual Transaction Absolute Maximum Daily Trading Limit (MWh) Pass / Fail	Process P1	Process P14, <i>Energy Market Interface</i>	Event based on <i>market participant</i> update
<p>Description:</p> <ul style="list-style-type: none"> • <i>Market participant</i> submitted absolute value of the maximum <i>trading limit</i> in MWh. Used for virtual transaction <i>bid</i> and <i>offer</i> screening method #1. • Pass / Fail estimation of cumulative Submitted-but-Not-Cleared (SNC) MWh exposure for all current <i>market participant</i> virtual transaction <i>bids</i> and <i>offers</i> submitted during the bidding window for the day-ahead market, evaluated against the <i>market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> in MWh. <ul style="list-style-type: none"> ○ If $SNC_{MWh} \leq$ Absolute value of the maximum daily MWh <i>trading limit</i>, then PASS ○ If $SNC_{MWh} >$ Absolute value of the Maximum daily MWh <i>trading limit</i>, then FAIL • Pass / Fail determination is returned to the participant <i>Energy Market Interface</i>. 			
Flow	Source	Target Processes	Frequency
Virtual Transaction Trading Limit Margin in dollars	Process P13	Process P14	Daily
<p>Description:</p> <ul style="list-style-type: none"> • IESO-determined virtual transaction <i>trading limit</i> margin in dollars. • Used for virtual transaction <i>bid</i> and <i>offer</i> screening method #2. 			
Flow	Source	Target Processes	Frequency

Hourly Virtual Zonal Price Deltas	Process P10	Process P14	Daily
<p>Description:</p> <ul style="list-style-type: none"> • $\Delta (DAP_{VTZ_{m,h}}, ARTP_{VTZ_{m,h}})$ the IESO-determined hourly price deltas in \$/MWh for each virtual zonal trading entity. • Used for virtual transaction <i>bid</i> or <i>offer</i> screening method #2. • The most current virtual price delta ($\Delta_{DAP, RTP}$) is provided to this process in order to evaluate the remaining virtual transaction <i>trading limit</i> margin value available to the <i>market participant</i> on the following day. 			
Absolute MWh Sum of Submitted Virtual Bids and Offers $SNC_{VT_{m,h}}$	Participant <i>Energy</i> Market Interface	Process P14	Event based on submission of each virtual <i>energy bid</i> or <i>offer</i>
<p>Description:</p> <ul style="list-style-type: none"> • Absolute sum of current submitted virtual transaction <i>bids</i> or <i>offers</i> by the <i>market participant</i> for each <i>dispatch hour</i> at all virtual transaction zonal trading entities. • This data flow includes for each <i>market participant</i>: <ul style="list-style-type: none"> ○ Current virtual transaction <i>bids</i> for each <i>dispatch hour</i> for all virtual transaction zonal trading entities. ○ Current virtual transaction <i>offers</i> for each <i>dispatch hour</i> for all virtual transaction zonal trading entities. 			
IESO-estimated Daily Cumulative SNC Dollar Exposure $SNC_{VT\$}$ Pass / Fail	Process P14	Participant <i>Energy</i> Market Interface	Event based on submission of each virtual <i>energy bid</i> or <i>offer</i>
<p>Description:</p> <ul style="list-style-type: none"> • $SNC_{VT\\$}$ Pass / Fail estimation of cumulative Submitted-but-Not-Cleared (SNC) dollar exposure for all current <i>market participant</i> virtual transaction <i>bids</i> and <i>offers</i> submitted during the bidding window for the day-ahead market evaluated against the IESO-determined virtual transaction <i>trading limit</i> margin. <ul style="list-style-type: none"> ○ If $SNC_{VT\\$} \leq$ Virtual transaction <i>trading limit</i> margin, then PASS ○ If $SNC_{VT\\$} >$ Virtual transaction <i>trading limit</i> margin, then FAIL • Pass / Fail determination is returned to the participant <i>Energy</i> Market Interface. 			

6.1.15. Process P15 – Issue Margin Warnings and *Margin Calls*

Description

Process P14 receives *margin call* and margin warning triggers for physical transaction and/or virtual transactions from the evaluation process P13.

The decision rules for the issuance of margin warnings and *margin calls* are described in Section 3.5.7 for physical transactions and 3.6.7 for virtual transactions.

Input and Output Data Flows

Table 6-15: Process P15 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Physical and Virtual Transaction Margin Warning and Margin Call Triggers	Process P13	Process P15	Daily and in the event of a material change in <i>prudential support</i> provided
<p>Description:</p> <ul style="list-style-type: none"> This data flow identifies when a <i>market participant's</i> AE has exceeded the margin warning or <i>margin call</i> threshold for combined physical transactions <i>market</i> activity and/or virtual transaction activity. This data flow contains: <ul style="list-style-type: none"> The identity of the <i>market participant</i>; Indication if the trigger is for a margin warning or a <i>margin call</i>; The amount of the margin payment required; and The type of activity (physical, virtual or participant engaging in both) to which it pertains for a given <i>market participant</i>. Not applicable to physical transactions and/or <i>real-time market</i> activity where the <i>market participant</i> has selected the <i>no margin call option</i>. 			
Flow	Source	Target Processes	Frequency
Margin Warnings	Process P15	<i>Market Participant</i>	As required

Flow	Source	Target Processes	Frequency
<p>Description:</p> <ul style="list-style-type: none"> This data flow is specific to a <i>market participant</i> whose <i>actual exposure</i> for physical transactions <i>market</i> activity and/or virtual transactions has exceeded the applicable margin warning threshold. This data flow contains: <ul style="list-style-type: none"> The identity of the <i>market participant</i>; The date and time the margin warning is issued; The type of activity (physical, virtual) to which the margin warning pertains; and The amount of margin remaining in the <i>trading limit</i> for the particular activity to which the warning pertains. 			
Flow	Source	Target Processes	Frequency
Margin Calls	Process P15	<i>Market Participant</i>	As required
<p>Description:</p> <ul style="list-style-type: none"> This data flow is specific to the <i>market participant</i> whose combined AE for physical transactions in the day-ahead market and/or <i>real-time market</i> and/or virtual transactions in the day-ahead market has exceeded the applicable <i>margin call</i> threshold. This data flow contains: <ul style="list-style-type: none"> The identity of the <i>market participant</i>; The date and time the <i>margin call</i> is issued; The amount of the <i>margin call</i> payment required; The <i>margin call</i> payment due date and time; and The type of activity (physical, virtual, or both) to which it pertains. 			
Temporary Suspension of Virtual Transactions	Process P15	<i>Energy Market Interface</i>	As required

Flow	Source	Target Processes	Frequency
<p>Description:</p> <ul style="list-style-type: none"> • This data flow is specific to the <i>market participant</i> whose combined AE for physical transactions in the day-ahead market and/or <i>real-time market</i> and/or virtual transactions in the day-ahead market, has exceeded the applicable <i>margin call</i> threshold. • This data flow contains: <ul style="list-style-type: none"> ○ the identity of the <i>market participant</i>; and ○ instructions to the <i>energy market</i> interface to temporarily suspend a <i>market participant's</i> virtual transaction trading privileges. 			

6.1.16. Process P16 – Confirm and Apply Payments

Description

Process P16 is informed of all payments exchanged between *market participant* and the *IESO* including but not limited to *margin call* payments, voluntary prepayments, penalties. This process requires all information related to *margin call* payments, voluntary prepayments, penalties given to the *market participant* and then tracks this against payments received in the *IESO* clearing account(s).

For a *market participant* engaging only in physical transactions or only in virtual transactions, and who is issued a *margin call*, the *IESO* will monitor the *market participant's* consolidated *exposure* against their *trading limit* (in dollars). The order of applying a payment received is:

1. Apply the *margin call* payment to reduce the *actual exposure* to 75% of the *trading limit*.
2. Remainder payment will apply to reduce *actual exposure* until the *actual exposure* reduced to zero dollars.
3. Any further remainder will apply to the upcoming *invoice*.

For a *market participant* engaging only in physical transactions or only in virtual transactions and who has made a voluntary prepayment on a given *business day*, the order of applying voluntary prepayment received is:

1. Reduce *actual exposure*.
2. Any remainder will apply to the upcoming *invoice*.

For a *market participant* who engages in both physical and virtual transactions and decides to make a voluntary prepayment on a given *business day*, the order of applying voluntary prepayment received is:

1. Reduce consolidated *actual exposure* for physical and virtual transactions.
2. Any remainder will apply to the upcoming *invoice*.

For a *market participant* engaging in both physical and virtual transactions, and who is issued a *margin call*, the following process will apply:

Note: The *IESO* monitors the *market participant's* consolidated *actual exposure* against their consolidated *trading limit* (in dollars) to issue this *margin call*. When a *margin call* payment is received to satisfy a *margin call* where a *market participant* engages in both physical and virtual transactions, the order of applying payment received is:

1. Apply the *margin call* payment to reduce the consolidated *actual exposure* to 75% of the consolidated *trading limit*.
2. Remainder payment will apply to reduce consolidated *actual exposure* for physical and virtual transactions until the *actual exposure* is reduced to zero dollars.
3. Any further remainder will apply to the upcoming *invoice*.

Input and Output Data Flows

Table 6-16: Process P16 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Margin Calls	Process P15	<i>Market Participant</i> and Process P16	As required
<p>Description:</p> <ul style="list-style-type: none"> • This data flow is specific to the <i>market participant</i> whose AE for physical transactions/<i>real-time market</i> activity and/or virtual transactions has exceeded the applicable <i>margin call</i> threshold. • This data flow contains: <ul style="list-style-type: none"> ○ The identity of the <i>market participant</i>; ○ The date and time the <i>margin call</i> was issued; ○ The amount of the margin payment required; ○ The payment due date and time; and ○ The type of activity (only physical, only virtual, combination of physical and virtual activity) to which it pertains. 			

Flow	Source	Target Processes	Frequency
Voluntary Prepayments /Margin Call Payments	Process P10	Process P16	As required
<p>Description:</p> <ul style="list-style-type: none"> This data flow allows Process P14 to reconcile outstanding <i>margin calls</i> issued by the <i>IESO</i> for physical transactions/<i>real-time market</i> activity and/or virtual transactions against payments received by the <i>IESO</i>, and ensures that such payments are applied to the consolidated <i>prudential support obligation</i>. This data flow contains: <ul style="list-style-type: none"> Accounts Receivable data; and Information about payments received into the <i>IESO</i> clearing account. 			

6.1.17. Process P17 – Draw-down Prudential Support

Description

Process P17 instructs *IESO* Market Cash Management sub-process and/or other downstream *IESO* processes that a decision has been made to draw-down on *prudential support* to cover a *market participant's* margin position for physical transaction activity and/or virtual transaction activity in the event that a margin payment has not been made within the specified time period.

Input and Output Data Flows

Table 6-17: Process P17 Input and Output Data Flows

Flow	Source	Target Processes	Frequency
Deficient Margin Calls	Process P16	Process P17	As required
<p>Description:</p> <ul style="list-style-type: none"> This data flow indicates outstanding <i>margin calls</i> that are either overdue, or where the corresponding payment from the <i>market participant</i> is insufficient. This data flow contains: <ul style="list-style-type: none"> The identity of the <i>market participant</i>. The amount of overdue <i>margin call</i> 			

<ul style="list-style-type: none"> ○ The type of activity (physical, virtual, or combined physical and virtual activity) to which it pertains. 			
Flow	Source	Target Processes	Frequency
List of Overdue Invoices	Market Invoicing and Payments	Process P17	As required
<p>Description:</p> <ul style="list-style-type: none"> • This data flow indicates a list of invoices which are overdue for any <i>market participant</i> • This data flow contain a list of invoices which are overdue for any <i>market participant</i> 			
Flow	Source	Target Processes	Frequency
Notice of Intent to Suspend	Process P17 <i>IESO</i> Legal/Compliance	<i>IESO</i> Legal/Compliance Process P17	As required
<p>Description:</p> <ul style="list-style-type: none"> • This data flow indicates notice which is prepared by treasury for review and issuance by <i>IESO</i> Legal/Compliance • This data flow contains: <ul style="list-style-type: none"> ○ The identity of a <i>market participant</i> ○ <i>Notice of Intent to Suspend</i> ○ The amount to remedy the <i>notice of intent to suspend</i> ○ The date by which the <i>notice of intent to suspend</i> needs to be remedied <p>To confirm an <i>event of default</i> has occurred, Treasury will consult with <i>IESO</i> Legal/Compliance. For a complete list of events of default, refer to Chapter 3, Section 6.3 of the <i>market rules</i>. If the amount on the <i>notice of intent to suspend</i> is not rectified, <i>IESO</i> Legal/Compliance will be notified.</p>			

Flow	Source	Target Processes	Frequency
Decision for Draw-down	Process P17 <i>IESO</i> Legal/Compliance	<i>IESO</i> Legal/Compliance Process P17	As required
<p>Description:</p> <ul style="list-style-type: none"> This data flow indicates information in regards to: <ul style="list-style-type: none"> the identity of the <i>market participant</i> the amount of suggested draw-down the type of <i>prudential support</i> (physical, virtual, or combined physical and virtual activity) to which the draw-down pertains. <p>Treasury reviews <i>prudential support</i> provided by <i>market participants</i> and recommends whether to draw on <i>prudential support</i>. The decision to draw on <i>prudential support</i> is made by <i>IESO</i> Legal/Compliance.</p>			
Flow	Source	Target Processes	Frequency
Draw-down instructions	Process P17	Market Cash Management	As required
<p>Description:</p> <ul style="list-style-type: none"> This data flow provides instructions to the <i>IESO's</i> Market Cash Management function to draw-down on a <i>market participant's prudential support</i> as a result of their failure to fully or partially comply with a <i>margin call</i> in a timely manner. Such instructions will include: <ul style="list-style-type: none"> The identity of the <i>market participant</i> The amount of the draw-down required The type of <i>prudential support</i> (physical, virtual, or combined physical and virtual activity) to which the draw-down pertains. 			

6.2. Internal Process Impacts

The internal processes currently used for the Prudential Security process will continue to have relevance in the future day-ahead market and *real-time market*.

Internal *IESO* processes related to the Prudential Security process include:

- Set *Prudential Support*

- Monitor Prudential Exposure

The above internal processes interact with various *IESO* processes as illustrated in Section 6.1. Some changes to the Prudential Security process under the market renewal program will impact other internal *IESO* processes. This impact will be contingent upon the tools of the future day-ahead market and *real-time market* which will be developed during the next phases of the project.

Changes or additions to internal *IESO* processes are for internal *IESO* use as documented in Appendix C, and are not included in the public version of this document. Appendix C details the impacts to internal processes in terms of existing processes that support the new market requirements, existing activities that need to be updated, and process and information models that may need to be updated to support the future market.

– End of Section –

Appendix A: Market Participant Interfaces

The following table provides a description of the changes and additions to *IESO* technical interfaces and forms with *market participants* that may be required to support the Prudential Security process design of the future day-ahead market and *real-time market*.

Table A-1: Impacts to Market Participant Interfaces

MP Interface Name	Interface Type	Description of Impact
Online IESO Authorization and Facility Registration System	Web client	<p>New <i>prudential support</i> initialization information will have to be collected through Online IESO as follows:</p> <ul style="list-style-type: none"> • General information about the <i>market participant</i>, such as the <i>market participant's IESO Organization ID</i> • Estimated <i>energy</i> consumption, will have to be further sub-divided between information pertaining to physical transactions versus virtual transactions. • Credit information, such as credit rating agency name, will continue to be only collected for physical transactions in order to determine the <i>prudential support obligation</i>. • For "metered participants", the provision of a <i>self-assessed trading limit</i> for physical transactions must be made separate and distinct from <i>trading limits</i> established by the same entity with respect to virtual transactions. • For non-"metered participants", the provision of a <i>self-assessed trading limit</i> for physical transactions must be made separate and distinct from <i>trading limits</i> established by the same entity with respect to virtual transactions.
Online IESO	Web client	<ul style="list-style-type: none"> • Supplemental Information for LDC Prudential Credit, <i>no Margin call option</i>, and <i>Small Distributor</i> will continue to be used to support input documentation related to <i>prudential support</i> for physical transactions.

MP Interface Name	Interface Type	Description of Impact
		<ul style="list-style-type: none"> If a <i>market participant</i> participates in a combination of virtual and physical transactions a <i>no margin call option</i> will not be an option for selection
Prudential Manager	Web client	<p>Modifications to support the collection of <i>prudential support</i> for physical transactions:</p> <ul style="list-style-type: none"> The 'Summary Tabulation of Total <i>Prudential Support Obligation</i> – Schedule A' needs to be modified to state that it applies to both physical transactions and virtual transactions and must now include the following for virtual transactions: <ul style="list-style-type: none"> <i>Market participant</i> submitted absolute value of the maximum daily <i>trading limit</i> (in MWh) <i>IESO</i>-calculated virtual transaction <i>minimum trading limit</i> (in dollars) <i>IESO</i>-calculated virtual transaction <i>default protection amount</i> <i>IESO</i>-calculated virtual transaction <i>maximum net exposure</i> equivalent to the <i>prudential support obligation</i> Net Creditor Status amount pledged against virtual <i>prudential support obligation</i> The 'Summary Tabulation of the Types of <i>Prudential Support</i> Posted with the <i>IESO</i> – Schedule B' needs to be modified to state that it applies to physical transactions and virtual transactions and include the following for virtual transactions: <ul style="list-style-type: none"> Only entries for irrevocable letters of credit are required for virtual transactions.
Pledge of Treasury Bills (IESO_AGR_0013) (Submitted through Online IESO)	Form	Must be modified in order to state that it applies only to physical transactions.

MP Interface Name	Interface Type	Description of Impact
Prudential Guarantee document (IMP_GRNT_0001) (Submitted through Online IESO)	Form	Will continue to be used to support Third-Party Guarantees and must be modified to state that it applies only to physical transactions.
Affidavit Regarding Reduction in Prudential Support Obligations (IESO_AFF_0001) (Submitted through Online IESO)	Form	<ul style="list-style-type: none"> <li>• Affidavit to show amount of collateral an LDC has collected from their customers (LDC's need to continue to attach copies, of bank statements showing any cash deposits, any letters of credit, guarantees, or Government of Canada T-bills, they hold as <i>prudential support</i>) <li>• Will continue to be used to support LDC <i>prudential support</i> reduction as per the OEB Retail <i>Settlement</i> Code and must state that it applies only to physical transactions.
Notification of Prepayment (IESO FORM 1130)	Form	Form to state prepayment is for both physical and virtual transactions and day-ahead and <i>real-time markets</i> .
Pledge Agreement for Net Creditor Status (NEW)	Form	New form may need to be introduced for a pledge agreement to support virtual transaction <i>prudential support obligations</i> .

– End of Appendix –

Appendix B: Internal Procedural Requirements *[Internal only]*

This section is confidential to the IESO.

Appendix C: Internal Business Process and Information Requirements *[Internal only]*

This section is confidential to the IESO.

References

Document Name	Document ID
MRP Detailed Design: Overview	DES-16
MRP Detailed Design: Authorization and Participation	DES-17
MRP Detailed Design: Offers, Bids and Data Inputs	DES-21
MRP Detailed Design: Publishing and Reporting Market Information	DES-27
MRP Detailed Design: Market Settlements	DES-28
MRP Detailed Design: Market Billing and Funds Administration	DES-29
Market Manual 1: Connecting to Ontario's Power System, Part 1.5: Market Registration Procedures	PRO-408
Market Manual 5: Settlements, Part 5.4: Prudential Support	MDP_PRO_0045
IESO Charge Types and Equations	IMP_LST_0001
Market Manual 5: Settlements, Part 5.9: Settlement Payment Methods and Schedules	MDP_PRO_0036
Guide to Prudentials at the IESO	N/A
Pledge of Treasury Bills	IESO_AGR_0013
Prudential Guarantee document	IMP_GRNT_0001
Notification of Prepayment	IESO_FORM_1130
Market Rules for the Ontario Electricity Market (Market Rules)	MDP_RUL_0002

– End of Document –