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MANUAL

Market Manual 5: Settlements

Part 5.4: Prudential Support

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This procedure describes the activities to be undertaken by the *IESO* and *market participants* to manage the prudential support required to participate in the *day-ahead market* and the *real-time market*.

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margin call option. Market participants that elect the *no margin call option* are exempt from receiving *margin calls* (Chapter 2, section 5.6.4 of the *market rules*). *Margin calls* are issued to *market participants* when their *actual exposure* reaches 100% of their *trading limit*. However, the *IESO* determines the *prudential support obligation* for *market participants* electing the *no margin call option* using an alternate methodology as described in Chapter 2, sections 5.6.5 and 5.6.6 of the *market rules*.

2.1.2.3 Application for Reductions

(Market Rules: Chapter 2, section 5.8)

Market participants that are not *distributors* may apply for one of credit rating or good payment history reductions to their *prudential support obligation* relative to their *maximum net exposure*.

Distributors may apply for one of credit rating or good payment history reduction in addition to the reduction for the *distributor* prudential credit to their *prudential support obligation* relative to their *maximum net exposure* for *physical transactions*:

- reduction for credit rating; or
- reduction for good payment history; and
- distributor prudential credit.

Note: The reductions mentioned in this section are only applicable to *maximum net exposure* for *physical transactions*.

Reduction for Credit Rating

If *market participants* elect the *margin call* option, they may apply to have their *prudential support obligation* for *physical transactions* reduced by requesting a reduction to their *maximum net exposure* using their credit rating (refer to Appendix C: Credit Ratings). For this application, *market participants* provide their credit rating in accordance with Standard & Poors, Moody's and DBRS Morningstar. *If market participants* share their credit rating with multiple *market participants,* they must provide all the associated *market participant* information along with the percentage share to be allocated to each.

If *market participants* elect the *no margin call option* and are *small distributors,* they may apply for a reduction based on their credit rating. However, *market participants* that are *small distributors* are not eligible for this reduction if they are authorized to conduct *virtual transactions*.

All other *market participants* that have elected the *no margin call option* are ineligible for a reduction for a credit rating.

Reduction for Good Payment History

If *market participants* elect the *margin call* option, they may apply to have their *prudential support obligation* for *physical transactions* reduced by requesting a reduction to their *maximum net exposure* based on evidence from the *market participants'* electricity purchases in Ontario (refer to Appendix D: Good Payment History).

All other *market participants* that have elected the *no margin call option* are ineligible for a reduction for a credit rating.

Distributor Prudential Credit

The Ontario Energy Board's Retail Settlement Code authorizes *distributors* to collect *prudential support* from their customers. In such cases, the retail customers post *prudential support* with the *distributor*, in addition to the *prudential support* for *physical transactions* posted by the *distributor* with the *IESO* for the same *energy* measured in MWh.

Distributors are permitted to apply a 60% reduction to their *prudential support obligation* for *physical transactions* for every dollar in *prudential support* they have collected from their customers (Chapter 2, section 5.8.8 of the *market rules*) if in one of the following "tangible" forms:

- cash;
- Government of Canada T-Bills;
- irrevocable commercial letters of credit from a Schedule Bank in Canada; and
- guarantees by a third person or affiliate.

To qualify for this reduction in their *prudential support obligation* for *physical transactions*, *distributors* must provide proof of the *prudential support* they have collected from their customers. They can provide this proof by swearing an "Affidavit Regarding Reduction in *Prudential Support* Obligations" – IMO_AFF_0001 form for *physical transactions*. This form is an affidavit attesting to the amount of tangible *prudential support* that *distributors* hold for their customers. The submitted proof may also include copies of the irrevocable letters of credit and bank statements detailing cash deposits held for such a purpose as requested by the *IESO*.

For example, if a *distributor* has a *maximum net exposure* of $25 million for its *physical transactions*, but the *distributor* has collected *prudential support* in the amount of $10 million from its own customers, and can provide verifiable proof (i.e. an affidavit) of said *prudential support* to the *IESO*, then its outstanding *prudential support obligation* would be $19 million [$25M – ($10M * 0.6)]. Any outstanding *prudential support obligation* would have to be met by using one or a combination of the other instruments listed in Chapter 2, section 5.7 of the *market rules*. Under this option, a *distributor* can also claim good payment history or credit rating reduction pursuant to Chapter 2, section 5.8.5 or 5.8.1A of the *market rules* to meet its *prudential support obligation* for its *physical transactions*. The *distributor* prudential credit will be deducted first before other applicable reductions can be applied.

Under a *no margin call option,* all *distributors*, with the exception of *small distributors*, will be ineligible for the *distributor* prudential credit.

2.1.2.4 Information to Calculate Maximum Net Exposure

Estimated Exposure

To estimate their *maximum net exposure* for *physical transactions*, *market participants* must submit their combined estimated daily maximum quantity of *energy* to be transacted in the both the *day-ahead market* and the *real-time market* and expected estimated peak load associated with the daily maximum quantity of *energy*. *Market participants* can update these estimated values in Online IESO for an upcoming *billing period* that may impact their *prudential support obligation*.

Option for Consideration of Physical Bilateral Contracts

Market participants with a credit rating of BBB– or higher, subject to any adjustments set out in Chapter 2, section 5.8.2 of the *market rules*, may choose to use the *IESO's settlement process* to settle their *physical bilateral contract*s. If *market participants* choose for the *IESO* to settle their *physical bilateral contract*s, they may submit to the *IESO* the aggregate *energy* quantities and duration associated with the *physical bilateral contracts* from all applicable *resources. Market participants* can then request that the *IESO* remove these *energy* quantities when calculating their *minimum trading limit* and *default protection amount in respect of physical transactions. Market participants* are required to also notify the *IESO* immediately upon a change in the submitted *energy* quantities or duration of their applicable *physical bilateral contracts,* including termination of any of the contracts.

Market Participant Self-Assessed Trading Limit

For the purpose of establishing *market participants*' *trading limit*s and *maximum net exposure* for *physical transactions*, *market participants* that conduct *physical transactions* are eligible to submit a self-assessed *trading limit* by providing either:

- the number of calendar days up to 70 calendar days, in which they intend to participate in *physical transactions* in the *day-ahead market* and the *real-time market*; or
- a dollar amount estimate of their *trading limits* for the upcoming *billing period*.

A *market participant* that intends to reduce the number of *margin calls* should base their *self-assessed trading limit* on 49 calendar days of market activity. If a *market participant* wants to post a lower *prudential support* amount, the *market participant* may at a minimum, use seven calendar days of market activity.

The *prudential support obligation* for *physical transactions* for *market participants* that are *energy traders* without experience conducting *physical transactions* for *energy* for at least three previous *energy billing periods* is equal to the greater of the following:

- the *minimum trading limit* plus the *default protection amount* for *physical transactions*; or
- $50,000, equalling the sum of its *minimum trading limit* of $25,000 and the *default protection amount* of $ 25,000 for *physical transactions*.

2.2.2. Assessment for Market Participants Not Authorized as Energy Traders

2.2.2.1 Margin Call Option

Upon receipt of *market participants' prudential support* information, the *IESO* undertakes a six-stage process to calculate *market participants' prudential support obligation* for *physical transactions* under a *margin call* option, during which the *IESO*:

- calculates the *minimum trading limit* as a dollar amount;
- calculates the *default protection amount* as a dollar amount;
- assesses the *minimum trading limit* against the *self-assessed trading limit* submitted by the *market participants*. The *IESO* then selects the greater of the two *trading limit* amounts and establishes the *maximum net exposure* for the *market participant* as the sum of the selected *trading limit* and the *default protection amount*;
- adjusts the *minimum trading limit* and *default protection amount* for *physical bilateral contracts*;
- applies any applicable reductions; and
- determines the *market participant's prudential support obligation* for *physical transactions*.

Figure 2-2 provides an illustration of how *physical transaction prudential support obligations* are determined for *market participants* that are not *energy traders* under a *margin call option*.

prices applicable to each *market participant* in the calculation of its *default protection amount* will be made available in the **Records** tab in Online IESO.

Determining the Maximum Net Exposure

(Market Rules: Chapter 2, section 5.3.1)

The *maximum net exposure*, in respect of *physical transactions*, is the *IESO's* estimate of the net *settlement amount market participants* could owe for conducting *physical transactions* in the *day-ahead market* and the *real-time market*.

The *IESO* establishes *market participants' maximum net exposure* for *physical transactions* by adding the *market participants' trading limit* for *physical transactions* and *default protection amount* for *physical transactions*. In the event *market participants' maximum net exposure* for *physical transactions* is negative or equal to zero, *market participants* are not required to post *prudential support*.

Adjustment of Minimum Trading Limit and Default Protection Amount for Physical Bilateral Contracts

(Market Rules: Chapter 2, sections 5.3.8A and 5.3.8B)

If *market participants* that are not *energy traders* request an adjustment based on their *physical bilateral contracts*, as described in section 2.1.2.4, the *IESO* calculates their *minimum trading limits* and *default protection amounts* by removing the *energy* quantities associated with the *market participants' physical bilateral contracts* registered with the *IESO.*

For this calculation, the *IESO* assumes all transacted quantities are completed through the *day-ahead market* and *real-time market* net of *energy* quantities associated with those *physical bilateral contracts*. For details on *physical bilateral contracts*, refer to Chapter 2, section 5.38A-5.3.8B and Chapter 8 of the *market rules*.

Application of Reductions

(Market Rules: Chapter 2, section 5.8)

Market participants may be eligible for a reduction to their *maximum net exposure* based on:

- the *market participants*' credit rating;
- the *market participants'* good payment history for the purchase of electricity in Ontario; or
- the *distributor* prudential credit.
- Appendix C and Appendix D provide further details for credit rating reductions for non-*distributors*, credit rating reductions for *distributors*, reduction amounts for good

payment history for non-*distributors* and reduction amounts for good payment history for *distributors.*

Determination of Prudential Support Obligation

The *maximum net exposure* less allowable reductions that may be permitted under Chapter 2, section 5.8 of the *market rules* constitute the amount of *prudential support obligation* for *physical transactions* that *market participants* not authorized as *energy traders* must submit*.* The *IESO* determines the *prudential support obligations* for *market participants* as follows:

- if the *maximum net exposure* calculated by the *IESO* for a *market participant* is positive, and available *prudential support* reductions do not lower the *market participant's prudential support obligation* to zero, the *market participant* must post *prudential support* to the *IESO*; and
- if a *market participant's maximum net exposure* for *physical transactions*, as calculated by the *IESO*, is zero or negative, the *market participant* is not required to post any *prudential support* to the *IESO* for *physical transactions*.

2.2.2.2 No Margin Call Option

(Market Rules: Chapter 2, sections 5.6.4 and 5.6.5)

For *market participants* that elect the *no margin call option*, the *IESO* establishes the *maximum net exposure* for those *market participants' physical transactions* by factoring in 70 calendar days of market activity into the calculation (Chapter 2, section 5.6.5 of the *market rules*). The *IESO* does not take into account *physical bilateral contracts* for the *day-ahead market* and *real-time market* towards *market participants' maximum net exposure* for their *physical transactions* under a *no margin call option.* Other than *small distributors, market participants* that elect the *no margin call option* are ineligible to receive reductions to their *maximum net exposure* (refer to Chapter 5, section 5.6.6 of the *market rules*).

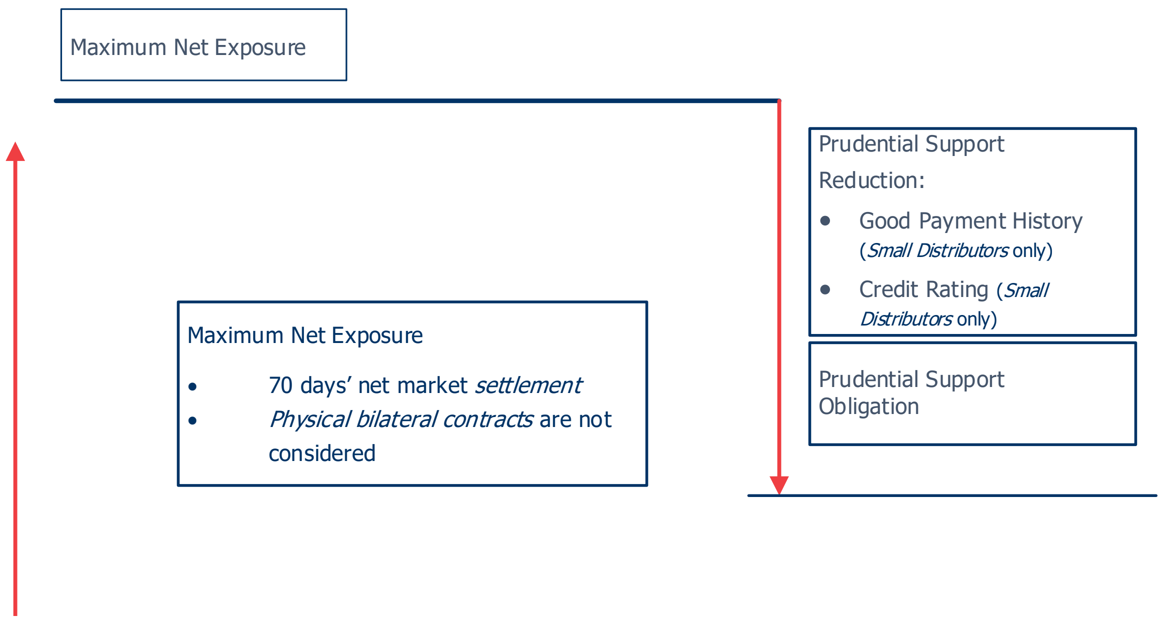

Figure 2-3: No Margin Call Option for Physical Transactions for a Market Participant that is not an Energy Trader

2.3. Informing of Prudential Support Obligations

After determining *prudential support obligations*, the following steps occur to inform *market participants* of their *prudential support obligations*:

1. Online IESO presents the *market participants'* proposed *prudential support obligation* for their review in the **Tasks** tab.
2. If the *market participants* are satisfied with the *IESO*-proposed *prudential support obligation*, they will submit the proposed amount into Online IESO for processing.
3. Upon approval of this amount by the *IESO*, an email notification from the *IESO* will be sent to the *market participants* advising them that the *prudential support obligation,* as set out in Schedule A assessment results, is available in Online IESO. Schedule A assessment results also reflect whether any allowable reductions are applied to the calculation of the *prudential support obligation.*

2.4. Posting of Prudential Support for Physical Transactions

(Market Rules: Chapter 2, section 5.7)

After *market participants* receive their Schedule A assessment results, they are then required to post *prudential support* to satisfy their *prudential support obligation* for *physical transactions* with the *IESO* or the *IESO's* custodian. *Prudential support* must be posted at least two weeks before *market participants* becomes authorized to participate in the *IESO-administered markets*. Furthermore, existing *market participants* that have previously posted *prudential support* in the form of a guarantee or letter of credit to satisfy their *prudential support obligation* for *physical transactions* must provide the *IESO* with updated *prudential support* for *physical transactions* in order to become authorized as *virtual traders* (Chapter 2, section 5.7.3A of the *market rules*). Such *market participants* must provide the *IESO* with replacement *prudential support* dated no earlier than January 1, 2023.

The *prudential support* posted by *market participants* to satisfy their *prudential support obligations* for *physical transactions* must be in one or a combination of the following formats as outlined in Chapter 2, section 5.7.2 of the *market rules*:

- a guarantee or an irrevocable commercial letter of credit, which is in a form acceptable to the *IESO* and provided by:
- a bank named in a Schedule to the *Bank Act*, S.C. 1991, c.46, with a minimum long-term credit rating of "A" from an *IESO*-approved credit rating agency; or
- a credit union licensed by the Financial Services Commission of Ontario with a minimum long-term credit rating of "A" from an *IESO*-approved credit rating agency;
- a guarantee in a form acceptable to the *IESO* provided by a person, other than an *affiliate* of the *market participant*, having a credit rating from an *IESO* approved credit rating agency;
- marketable securities in the form of Canadian Government treasury bills. Such treasury bills shall be valued as cash at their current market value less 2% to take into account the potential eroding effects of interest rate increases;
- subject to Chapter 2, section 5.7.4 and 5.7.4A of the *market rules*, a guarantee in a form acceptable to the *IESO* provided by a person that is a rated *affiliate* of the *market participant* and has a credit rating from an *IESO* approved credit rating agency (refer to Chapter 2, sections 5.7.2.2, 5.7.3A, 5.7.3B, 5.7.4 and 5.7.4A of the *market rules* for limits on the guarantee from a rated *affiliate*); or
- cash deposits made to the *IESO* by a *market participant* or on the *market participant's* behalf, as long as the *market participant* meets the following criteria:
- the *market participant* had already met its *prudential support obligation* for *physical transactions* in whole or in part through a cash deposit on November 4, 2004; and
- the *market participant's prudential support obligation* for *physical transaction* was $200,000 or less on November 4, 2004 and it remains $200,000 or less.

Once a *market participant* posts its *prudential support*, the *IESO* will review and, upon acceptance, will send the *market participant* an e-mail notification stating that a detailed Schedule A is available in the **Prudential Support Obligation** tab of the **Prudential Manager.**

2.5. Updating the Prudential Support Obligation for Physical Transactions

(Market Rules: Chapter 2, section 5.3.11)

To ensure that the *prudential support* posted by *market participants* is sufficient to satisfy their *prudential support obligations*, the *IESO* regularly reviews *market participants' prudential support obligations* for *physical transactions*. The *IESO* conducts this review in the following circumstances and applicable timelines:

- prior to the start of each *energy market billing period,* when the *IESO* reviews:
- the daily trading activity in MWh for *market participants* that are not an *energy trader* against their submitted daily quantity in MWh; or
- the average net settlement amounts for the most recent three *energy market billing periods* for *market participants* that are *energy traders*;
- within two business days after *market participants' actual exposure* for *physical transactions* exceeds the *market participants' trading limits* (with the exception of *market participants* under the *no margin call option*);
- within two *business days* after the *IESO* receives notice of any changes to the status of a *market participant* if the *IESO* determines that the change in such status would have a material impact on the *market participant's maximum net exposure.* Examples of such changes include operational changes, such as increase or decrease in load, peaks, etc.;
- when the *IESO* has adjusted the *minimum trading limit* for *market participants* that are *energy traders* conducting *physical transactions* pursuant to Chapter 2, section 5.3.4.3 of the *market rules*;
- when the *IESO* has adjusted its price basis under Chapter 2, section 5.3.10B of the *market rules*; and
- when the *IESO* annually estimates future Class A or Class B *global adjustment* amounts.

If the *IESO* review reveals that *market participants' maximum net exposure* for *physical transactions* has changed from the amount that was previously determined, the *IESO* will update the *market participants'* Schedule A[5] accordingly, and inform the *market participants* of the same. If *market participants* are required to post additional *prudential support* as a result of the change to their *maximum net exposure* for *physical transactions*, they must

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[5] A Schedule A sets out a *market participant's prudential support obligation* and is available in the "prudential support obligation" tab of the Prudential Manager on the *IESO* portal. Schedule A also reflects whether any allowable reductions are used in the calculation of the *prudential support obligation.*

provide the additional *prudential support* within five *business days* from the effective date of the change.

There are circumstances where *market participants* may be required to re-establish a portion or all of their *prudential support* to ensure that their *prudential support obligations* for *physical transactions* are satisfied. These circumstances include but are not limited to:

- if any part of *market participants' prudential support* is due to expire or terminate, those *market participants* must provide the replacement at least 10 *business days* before the expiry date;
- if any part of *market participants' prudential support* is otherwise no longer current or valid, the *market participants* must provide a replacement within two *business days* of being notified to that effect by the *IESO*; or
- if the *IESO* draws or claims any part of the *market participants' prudential support*, the *market participant* must provide a replacement within five *business days* of receiving notice from the *IESO*.

2.5.1. Credit Warnings in the context of Physical Transactions

(Market Rules: Chapter 2, section 5.8.2)

If the *IESO* determines that there is a credit watch negative warning for a *market participant*, there is an automatic one-notch reduction in the *market participant's* credit rating (for example, from BBB+ to BBB), as set out in Appendix C . A credit watch negative warning is generated when there is a movement of the *market participant* to a negative credit watch status by any *IESO* approved bond-rating agencies. The *IESO* will review the *market participant's prudential support obligation* for *physical transactions* and/or review the acceptability of any prudential guarantees received as *prudential support* for *physical transactions*, based on the revised credit rating of the guarantor.

– End of Section –

3. Daily Monitoring of Prudential Support for Physical Transactions

The *IESO* verifies that each *market participant* has provided sufficient levels of *prudential support* to cover their financial trading activity for both the *day-ahead market* and the *real-time market*. Daily monitoring applies to *market participants* who are subject to *margin calls* by not electing the *no margin call option.*

Daily monitoring for *market participants* authorized to conduct *physical transactions* consists of the following activities:

- the *IESO* calculates *market participants'* estimated *actual exposure* using an estimate of charges;
- the *IESO* compares the calculated *actual exposure* against the *trading limit* to determine whether to issue a *margin call* or a *margin call* warning[6] to a *market participant*; and
- *market participants* take actions to respond to *margin calls* or *margin call* warnings.

Throughout the process, *market participants* can view their own estimated *actual exposure* and *margin call* warnings and *margin calls* using the **Prudential Manager**.

3.1. Estimated Actual Exposure for Physical Transactions

(Market Rules: Chapter 2, section 5.5.1)

Market participants' actual exposure for their *physical transactions* are comprised of the following components:

- cleared-but-not settled (for *dispatchable resources*) or six-day activity estimate (for *resources* that are not *dispatchable*);
- settled-but-not-invoiced;
- other *settlement amounts* estimated daily; and
- prepayments.

[6] The *IESO issues margin call warnings* by delivering a "Notice of Margin Call Warning" via a generic email.

3.1.1. Cleared-But-Not-Settled or Six-Day Activity Estimate for Physical Transactions

Settlement amounts for a given *trading day* are first calculated by the *IESO* on the seventh calendar day following a *trading day*. As a result, the *IESO* must estimate *actual exposure* during the six-calendar day period during which *settlements* data is unavailable using the following components:

- for *physical transactions* conducted by *market participants* by using *dispatchable resources*: a cleared-but-not-settled component; and
- for *physical transactions* conducted by *market participants* by using *resources* that are not *dispatchable*: a six-day activity estimate component.

3.1.1.1 Cleared-but-Not-Settled for Physical Transactions Conducted by a Market Participant by Using a Dispatchable Resource or Price Responsive Load

The cleared-but-not-settled calculation for *physical transactions* applies to *market participants* conducting *physical transactions* using *dispatchable resources*. It is an estimate based on *bids* and *offers* of the net amount of *dispatched energy* and *operating reserve* that has not yet been settled.

Cleared-but-not settled amounts for *physical transactions* are applicable to *market participants* using the following *dispatchable resources:*

- *dispatchable generation resources*;
- *dispatchable loads*; and
- *boundary entity resource* import and export transactions.

For the purpose of calculating the cleared-but-not-settled component, *physical transactions* conducted by *market participants* by using *price responsive loads* are subject to the same methodology as used for *dispatchable loads*.

The *IESO* updates the cleared-but-not-settled component applicable to the *physical transactions* conducted by *market participants* by using a *dispatchable resource* on a daily basis.

At any given time, the *IESO's* rolling six-calendar days cleared-but-not-settled calculation covers the previous six calendar days with market activity that has not yet been re-categorized under the settled-but-not-invoiced component. On the seventh calendar day following a given *trading day* with market activity, the *IESO* removes the amount for the oldest calendar day from the six-calendar day rolling calculation of the cleared-but-not-settled calculation and adds the amount from the calendar day to the settled-but-not-invoiced total. The daily update to the cleared-but-not-settled calculation by the *IESO* reflects the total based on the cleared-but-not-settled calculation for that *trading day*.

3.1.1.2 Six-Day Activity Estimate Calculation for Physical Transactions Conducted by a Market Participant by Using a Resource that is Not Dispatchable

The six-day activity estimate calculation for *physical transactions* applies to *market participants* conducting *physical transactions using resources* that are not *dispatchable*. *Physical transactions* conducted by *market participants* by using *resources* that are not *dispatchable* include but are not limited to:

- transactions arising from the consumption of *energy* from *non-dispatchable loads* such as local distribution companies; and
- transactions arising from the injection of *energy* by *market participants* using *self scheduling generation resources.*

For a given *trading day*, the *IESO's* rolling six-day activity estimate uses the average Allocated Quantity of Energy Withdrawn ("AQEW") or the Allocated Quantity of Energy Injected ("AQEI") from the previous six calendar days and multiplies the quantities by the applicable average daily prices.

3.1.2. Settled-but-Not-Invoiced for Physical Transactions

The settled-but-not-invoiced component represents *settlement amounts* specific to a *market participant* that appear on the *preliminary settlement statements* or *final settlement statements* but that have not yet appeared on a *market participant's invoice*.

The *IESO* determines the settled-but-not-invoiced component of the *actual exposure* for *physical transactions* based on a *market participant's day-ahead market* and *real-time market* activity*.* All *settlement amounts* used in the settled-but-not-invoiced component are either hourly or non-hourly charges from a *market participant's preliminary settlement statements* and *final settlement statements*. For details on physical *settlement statements*, refer to Market Manual 5 Settlements Part 5.5: Physical Markets Settlement Statements.

3.1.3. Other Settlement Amounts Estimated Daily

On a daily basis, the *IESO* estimates other *settlement amounts*. The other *settlement amounts* do not fall under the category of cleared-but-not-settled, six-day estimate and are non-hourly. The majority of these non-hourly *settlement amounts* are calculated based on legislation and regulation in Ontario. *Market participants* may view all *settlement amounts* under the *actual exposure* calculation through the **Estimated Net Exposure** tab in the **Prudential Manager**.

3.1.4. Prepayments

Market participants may reduce the level of their estimated *actual exposure* at any time by making a pre-payment to the *IESO*, and then logging in to send the *IESO* an electronic Notification of Prepayment using **Prudential Manager**. These prepayments are then applied to the *invoice* once the invoice is issued. These include *margin call* prepayments and voluntary prepayments.

3.2. Margin Call Warnings and Margin Calls for Physical Transactions

(Market Rules: Chapter 2, section 5.4 and 5.6)

Table 3-1 summarizes the actions taken by the *IESO* based on a comparison of *market participants' trading limit* for *physical transactions* and their *actual exposure* for *physical transactions.*

Table 3-1: Actions Taken as a Result of Daily Monitoring of Physical Transactions

Trading Limit – AE comparison	**IESO Action**	**Market Participant Action**
Actual exposure < 70 % *trading limit*	None	None
70% *trading limit* <= *actual exposure* < 100 % *trading limit*	The *IESO* issues a "Notice of Margin Call Warning" to *market participants* for their *physical transactions* for the *day-ahead market* and the *real-time market* via a generic e-mail.	*Market participants* may make a cash payment to reduce a portion of any amounts payable to the *IESO* to reduce their *actual exposure* for *physical transactions*, or take other appropriate actions to ensure that their *actual exposure* for *physical transactions* does not reach their *trading limit* for *physical transactions* (Chapter 2, section 5.4.1 of the *market rules*).
Actual exposure >= 100 % *trading limit*	The *IESO* issues a *margin call* to *market participants* for their *physical transactions* for the *day-ahead market* and the *real-time market* via a generic e-mail.	A *market participant* is required to satisfy a *margin call* by paying cash in an amount sufficient to reduce its *actual exposure* for *physical transactions* to no more than 75% of the *market participant's trading limit* for *physical transactions* (Chapter 2, section 5.6.1 and 5.6.2 of the *market rules*). Note, payment must be made by 4:00 pm eastern prevailing time (EPT) on the second business day following the date of the *margin call*.

Note, *market participants* can log on to the **Prudential Manager** located on the *IESO* portal to view *margin call* warnings and *margin call* details.

The *IESO* has the authority to draw upon all or part of the *market participant's prudential support* for *physical transactions* in the event that *market participants* default on their required *margin call* payment. *Market participants* are considered to have defaulted on the required *margin call* payment if their *actual exposure* for *physical transactions* is not reduced to no more than 75% of the *trading limit* for *physical transactions* by 4:00 pm EPT on the second *business day* following the date of the *margin call*.

– End of Section –

4. Setting Prudential Support Obligations for Virtual Transactions

The *IESO* requires that *market participants* be authorized as *virtual traders* to conduct *virtual transactions* in the *day-ahead market* (refer to Market Manual 1: Connecting to Ontario's Power System Part 1.5: Market Registration Procedures, section 2). To account for the heightened risk profile associated with *virtual transactions*, the authorization to conduct *virtual transactions* gives rise to a *prudential support obligation* specific for *virtual transactions*. Therefore, the *IESO* calculates the *prudential support obligation* for *virtual transactions* and *actual exposure* for *virtual transactions* differently than for *physical transactions*.

The following section describes the process of setting *market participants' prudential support obligations* and posting of *prudential support* for *market participants* authorized as *virtual traders.*

The process is made up of the following activities:

1. *Market participants* submit *prudential support* information to the *IESO* using Online IESO.
2. The *IESO* uses the information submitted by *market participants* to determine that *market participant's prudential support obligation* subject to any applicable reductions.
3. The *IESO* informs *market participants* of their *prudential support obligation*. If this is the first time *market participants* have submitted *prudential support* or if there is a requirement to change the amount of *prudential support*, the *IESO* will inform *market participants* through Online IESO.
4. *Market participants* post their *prudential support* in a form required by the *IESO*.
5. The *IESO* receives the *prudential support* and either accepts or rejects the *prudential support*. If the *prudential support* is accepted by the *IESO*, the *IESO* sends an e-mail notification to the *market participant* which states the detailed Schedule A[7] is

[7] A Schedule A sets out a *market participant's prudential support obligation* and is available in the **Prudential Support Obligation** tab of the **Prudential Manager** on the *IESO* portal.

available to be viewed by the *market participant* in the **Prudential Support** tab of the **Prudential Manager**.

4.1. Submitting Prudential Support Information for Virtual Transactions

As part of the Authorization and Participation process described in Market Manual 1: Connecting to Ontario's Power System Part 1.5: Market Registration Procedures, all *market participants* must submit their *prudential support* information using Online IESO. To do this, each *market participant* must first assign a Prudential Requirements Contact, who will be granted permissions in Online IESO to submit information required to establish the *market participant's prudential support obligation.* The Prudential Requirements Contact is also the *IESO's* point of contact for matters relating to *prudential support*.

After authorization, *market participants* must keep the *IESO* informed of circumstances that could change their *prudential support obligation* for *virtual transactions* by using Online IESO. *Market participants* must confirm that all amounts of *prudential support* continue to satisfy the *market participants' prudential support obligation*. Notably, this is likely to occur in the circumstances that include but are not limited to:

- if there has been a change to the *market participant's* credit ratings; or
- if an *event of default* occurs.

Market participants authorized (or requesting authorization) to conduct *virtual transactions* shall provide, using Online IESO, their *maximum daily trading limit.* This limit represents the maximum quantity a *virtual trader* may *bid* or *offer* in a given *trading day* and is the absolute value in MWh that can be submitted by a *virtual trader*. The *maximum daily trading limit* is the input by which *market participants* may adjust the amount of their *trading limits* for *virtual transactions*, and accordingly, their *prudential support obligations for virtual transactions*. In addition, *market participants* should review their *maximum daily trading limit* prior to the start of each *billing period* and submit a revised *maximum daily trading limit*, as appropriate.

The maximum daily *trading limit* is applicable for all *energy market billing periods* until a revised maximum daily *trading limit* is submitted by *market participants*. If *market participants* submit a revised maximum daily *trading limit*, this maximum daily *trading limit* will supersede any previous maximum daily *trading limit* once approved by the *IESO*. If the revised maximum daily *trading limit* results in an increase in the *market participants' prudential support obligations* for its *virtual transactions*, the *market participant* must provide the *IESO* with additional *prudential support* before the *IESO* authorizes the increase in the maximum daily *trading limit*.

4.2. Determining the Prudential Support Obligation for Virtual Transactions

The *prudential support obligations* for *virtual transactions* represents an amount that is distinct from a *prudential support obligation* for *physical transactions*, and is determined using a different methodology. Notable differences between the calculation of a *prudential support obligation* for *physical transactions* and a *prudential support obligation* for *virtual transactions* include the following:

- the *no margin call option* is unavailable to *market participants* authorized to conduct *virtual transactions*; and
- *prudential support obligations* for *virtual transactions* are not eligible for the same reductions available for *prudential support obligations* for *physical transactions*.

The *IESO* undertakes the following five-step process to establish the *prudential support obligation* for *virtual transactions*:

1. Establish the price delta quantity applicable to all *market participants* authorized to conduct *virtual transactions.*
2. Calculate the *minimum trading limit* (in dollars) for the *market participant*.
3. Calculate the *default protection amount* (in dollars) for the *market participant*.
4. Apply a reduction to the *prudential support obligation* for *virtual transactions* based on credit received for *physical transactions*, if applicable.
5. Determine the *prudential support obligation* for the *market participant* (in dollars).

Figure 4-1 provides an illustration of how a *market participant's virtual transaction prudential support obligation* is determined.

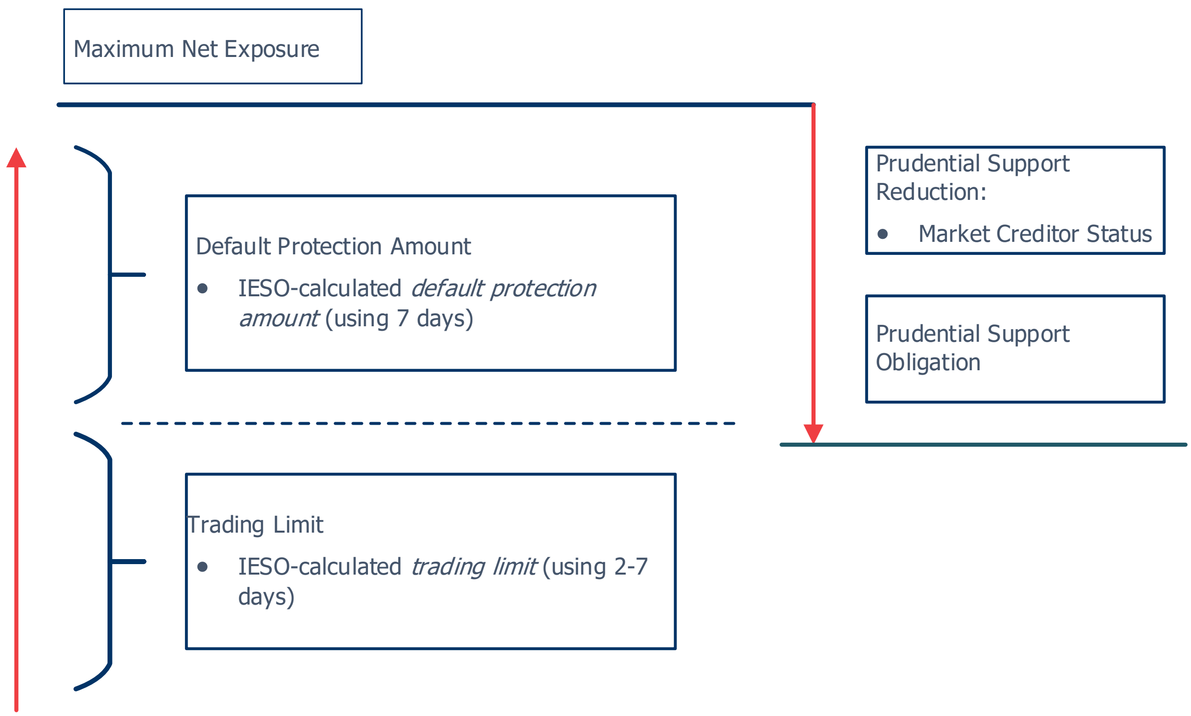

Figure 4-1: Margin Call Option for Virtual Transactions

4.2.1. Determining the Price Delta for Prudential Support Obligation for Virtual Transactions

(Market Rules: Chapter 2, section 5C.1.9)

To determine *market participants' prudential support obligations* for *virtual transactions*, the *IESO* uses various inputs. One of these inputs is a price delta that is applicable to all *virtual traders* at a given time. The *IESO* calculates a single price delta for an interim period and an enduring period using historical data. The price delta for the interim period will be calculated using historical data based on outcomes from the day-ahead commitment prices and shadow prices. After the *IESO* accumulates *day-ahead market* and *real-time market* historical price data for the period mentioned in the section below, the *IESO* will calculate an enduring price delta. The circumstances where the *IESO* is required to review the interim price delta are the same as the circumstances used for the enduring price delta.

4.2.1.1 Enduring Price Delta for Prudential Support Obligation for Virtual Transactions

The *IESO* determines a price delta between the *day-ahead market* and the *real-time market* applicable to *virtual traders.* A single price delta applies to all *virtual traders* and is used as one of the inputs by the *IESO* to calculate the:

- *minimum trading limit* for *virtual transactions*; and
- *default protection amount* for *virtual transactions*.

The price delta represents the absolute value of the difference between the day-ahead virtual zonal *energy* price and the hourly average real-time virtual zonal *energy* prices. Each year, the *IESO* determines the price delta by:

- collecting *energy* prices for all hours over the most recent three years for all *virtual transaction zonal trading entities;*
- assessing the difference between the day-ahead virtual zonal *energy* price and the applicable hourly average real-time virtual zonal *energy* price;
- identifying the 97th percentile for the data set*;* and
- modifying the price delta if it has increased or decreased by 15% or more from the previous delta.

The *IESO* publishes the price delta for *market participants* through the *IESO* website. The *IESO* annually updates the data used to calculate the price delta by replacing the data from the oldest year with data from the most recent year. The *IESO* also performs an annual review, and modifies the price delta if it has increased or decreased by 15% or more from the previous delta.

4.2.1.2 Interim Price Delta for Prudential Support Obligation for Virtual Transactions

The *IESO* uses an interim price delta, made up of a smaller data set, until three years of hourly day-ahead virtual zonal *energy* prices and hourly average real-time virtual zonal *energy* prices are available. Similar to the enduring price delta, the *IESO* uses the 97th percentile of interim price delta data to set the interim price delta to be used for the calculation of *prudential support obligations* for *virtual transactions*.

4.2.2. Determining the Minimum Trading Limit for Virtual Transactions

The *IESO* calculates *market participants*' *minimum trading limit* (in dollars) for *virtual transactions* based on the maximum daily *trading limit* quantity (in MWh) submitted by *market participants*. The *IESO*-determined *minimum trading limit* for *virtual transactions* will be the *trading limit* for *virtual transactions*.

Equation 4-1 contains the formula for calculating *the minimum trading limit* for *virtual transactions*.

Equation 4-1: Minimum Trading Limit for Virtual Transactions

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

where:

Variable	Description
$\mathrm{TL_{VT\$}}$	is the *minimum trading limit* for *virtual transactions* (in dollars);

Variable	Description
TL_{VT}	is the *market participant* submitted absolute value of the *maximum daily trading limit* quantity (in MWh) for *virtual transactions;*
$\Delta\, DAP_{VT}, ARTP_{VT}$	is the *IESO* determined price delta calculated in accordance with section 4.2.1 of this *market manual*;
$\#Days_{TL}$	is the *minimum trading limit* assessment period for *virtual transactions* denoted as a number of calendar days assuming two calendar days of participation in the *day-ahead market* with the *IESO's* authority to increase up to and including seven calendar days if the *market participant* was subject to more than one *margin call* per *energy market billing period*; and
U_{VT}	is the *virtual transaction* uplift estimation rate in $/MWh. This is the *IESO's* estimation of *day-ahead market* reliability unit commitment uplift amounts that may be incurred by *virtual transaction offers* to provide *energy*. This rate may be updated on annual basis if it increases or decreases by 15% or more.

4.2.3. Determining the Default Protection Amount for Virtual Transactions

(Market Rules: Chapter 2, section 5C.1.7)

The *IESO* determines the *default protection amount* for *virtual transactions* using the same formula to calculate the *minimum trading limit* for *virtual transactions*. Although the formula is the same, the number of calendar days used in each calculation can differ. When calculating the *default protection amount,* the *IESO* uses seven calendar days of participation in the *day-ahead market*.

Equation 4-2 contains the formula for the *default protection amount* for *virtual transactions*.

Equation 4-2: Default Protection Amount for Virtual Transactions

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

where:

Variable	Description
TL_{VT}	is the *market participant* submitted absolute value of the *maximum daily trading limit* quantity (in MWh) for *virtual transactions*;
$\Delta\, DAP_{VT}, ARTP_{VT}$	is the *IESO* determined price delta calculated in accordance with section 4.2.1 of this *market manual*;

Variable	Description
$\#Days_{DPA}$	is the *default protection amount* assessment period for *virtual transactions* for seven calendar days; and
U_{VT}	is the *virtual transaction* uplift daily estimation rate, in $/MWh. This is the same as the rate used for the calculation of the *minimum trading limit* for *virtual transactions*.

4.2.4. Applicable Reduction

(Market Rules: Chapter 2, section 5C.6)

Market participants may be eligible for a reduction to their *maximum net exposure* for *virtual transactions* based on their credit with the *IESO* in accordance with Chapter 2, section 5C.6.1 of the *market rules*, as expressed in Equation 4-3.

Equation 4-3: Applicable Reduction to Maximum Net Exposure for Virtual Transactions

$$PSO_{VT\$} = TL_{VT\$} + DPA_{VT\$} - (0.75 \times AIS_{VT\$})$$

where:

Variable	Description
$PSO_{VT\$}$	is the *market participant's prudential support obligation* for *virtual transactions* (in dollars)
$TL_{VT\$}$	is the *minimum trading limit* for *virtual transactions* (in dollars)
$DPA_{VT\$}$	is the *default protection amount* for *virtual transactions* (in dollars)
$AIS_{VT\$}$	is the average of its most recent six consecutive *invoices* where a *market participant* conducts *physical transactions* using a *generation unit* and is eligible for market creditor status (in dollars)

4.3. Posting of Prudential Support for Virtual Transactions

(Market Rules: Chapter 2, section 5C.5)

Market participants may satisfy their *prudential support obligations* for *virtual transactions* by submitting a guarantee or an irrevocable commercial letter of credit, which in both cases must be in a form acceptable to the *IESO* and provided by (Chapter 2, section 5C.5.2 of the *market rules*):

- a bank named in a Schedule to the *Bank Act*, S.C. 1991, c.46, with a minimum long-term credit rating of "A" from an *IESO* approved credit rating agency; or
- a credit union licensed by the Financial Services Commission of Ontario with a minimum long-term credit rating of "A" from an *IESO* approved credit rating agency.

Market participants that are authorized to conduct both *physical transactions* and *virtual transactions* must post an authorized form of *prudential support* for each of their *prudential support obligations* for *physical transactions* and *virtual transactions*. The *IESO* may draw upon both physical forms of *prudential support* and virtual forms of *prudential support* in the *event of default* by *market participants* engaging in both *physical transactions* and *virtual transactions*.

4.4. Updating the Prudential Support Obligation for Virtual Transactions

(Market Rules: Chapter 2, section 5C.1.12)

The *IESO* will, on an ongoing basis, review a *market participant's minimum trading limit*, *trading limit*, *default protection amount* and *maximum net exposure*, for *virtual transactions* in circumstances that include:

- prior to the start of each *energy market billing period*;
- within two *business days* after a *market participant's actual exposure* for *virtual transactions* exceeds the *market participant's trading limit* for *virtual transactions*;
- within two *business days* after it receives notice of any changes to the status of a *market participant* as compared to such status that was in effect when the *market participant's maximum net exposure* for *virtual transactions* was last calculated if the *IESO* determines that the change in such status would have a material impact on the *market participant's maximum net exposure* for *virtual transactions* (e.g., change in the market creditor status of a *market participant* conducting *virtual transactions*);
- when the *IESO* has adjusted a *market participant's minimum trading limit,* if the *market participant* was subject to more than one *margin call* per *billing period*, pursuant to (Chapter 2, section 5C.1.4 of the *market rules*);
- when the *IESO* has adjusted the price delta under (chapter 2, section 5C.1.9 of the *market rules*); and
- when the *market participant* amends its previously submitted *maximum daily trading limit* quantity (in MWh) for *virtual transactions*.

Should a *market participant's maximum net exposure* for *virtual transactions* change as revealed over the course of the *IESO's* review, the *IESO* will inform the *market participant* of an updated Schedule A. In all such cases where the *prudential support obligation* increases, *market participants* must respond by providing additional *prudential support* for their *virtual transactions* within five *business days* from the effective date of the change.

Similarly, *market participants* must keep the *IESO* informed of circumstances that could change their *prudential support obligation* for *virtual transactions* and ensure that all amounts of *prudential support* continue to satisfy the *market participants' prudential support obligations*.

There are circumstances where a *market participant* may be required to update a portion or all of its *prudential support* for *virtual transactions* to ensure that its *prudential support* obligation is satisfied. These circumstances include:

- if any part of a *market participant's prudential support* is due to expire or terminate, the *market participant* must provide the replacement at least 10 *business days* before the expiry date;
- if any part of a *market participant's prudential support* is otherwise no longer current or valid, the *market participant* must provide a replacement within two *business days*; and
- if the *IESO* draws or claims any part of the *market participant prudential support*, the *market participant* must provide a replacement within five *business days* of receiving notice from the *IESO*.

If a revision to the maximum daily *trading limit* is not submitted by *market participants*, the *IESO* treats the previously submitted maximum daily *trading limit* for *virtual transactions* as a standing maximum daily *trading limit* for *virtual transactions* (Chapter 2, section 5C.1.3 of the *market rules*).

– End of Section –

5. Daily Monitoring of Prudential Support for Virtual Transactions

The *IESO* monitors *market participants' virtual transaction* activity within the *IESO-administered markets* using two methods:

- the *IESO* performs the daily screening of *bids* and *offers* that have been submitted-but-not-cleared during the *day-ahead market* submission window with respect to *virtual transactions*; and
- the *IESO* performs the daily monitoring of *actual exposure* for *market participants' virtual transactions* against that *market participant's IESO*-determined *trading limit* for *virtual transactions*.

These methods require the *IESO* to determine and use *day-ahead market* to *real-time market* price deltas, which are described in greater detail in the sub-sections that follow.

5.1. Daily Screening of Virtual Transactions

(Market Rules: Chapter 2, section 5C.2.3)

Market participants that submit *bids* and *offers* related to *virtual transactions* for the *day-ahead market* during the *day-ahead market* submission window will have all of their *virtual transactions* rejected if they fail either of the following two screenings:

- daily *bid* and *offer* quantity screening; or
- daily dollar exposure screening.

If *market participants* fail one of the screenings, they will receive a rejection message through the Energy Market Interface ("EMI") and will not be able to submit *bids* or *offers* in the *day-ahead market* up until the close of the *day-ahead market* submission window for a given *trading day*. In order to avoid the rejection of the *virtual transaction bids and offers market participants* should consider using the formulae listed in Chapter 2, section 5C.2.1 of the *market rules* to calculate the potential exposure for their *virtual transaction bids* and *offers*.

5.1.1. Daily Bid and Offer Quantity Screening

The *IESO* screens the *market participants*-submitted *virtual transaction bid* and *offer* quantities (in MWh) against their *maximum daily trading limit* quantity (in MWh) supplied by *market participants* in the EMI. The *IESO* will reject the *market participants'*-submitted *virtual transaction bid* and *offer* quantities should the *market participants' virtual transaction bids* and *offer* quantities (in MWh) exceed their *maximum daily trading limit* quantity (in

MWh). The *IESO's* daily *bid* and *offer* quantity screen calculate the absolute value of the sum of all *virtual transaction bid* and *offer energy* quantities (in MWh) submitted by the *market participant* at any of the virtual zonal trading entities during the *day-ahead market* submission window.

5.1.2. Daily Exposure Screening

The *IESO* screens whether the *market participants' IESO*-estimated daily cumulative submitted-but-not-cleared dollar exposure exceeds the *market participants' IESO*-determined *virtual transaction trading limit* margins. The *IESO* determines *market participants' virtual transaction trading limit* margins by deducting the *market participants' actual exposure* for *virtual transactions* from their *trading limit* for *virtual transactions* on a daily basis.

Equation 5-1 contains the formula for the submitted-but-not-cleared dollar exposure used by the *IESO* as part of the daily dollar exposure screen.

Equation 5-1: Submitted-but-not-cleared Dollar Exposure as part of the Daily Exposure Screen

$$\mathrm{SNC}_{\mathrm{VT\$}} = \sum_{m=1}^{M} \sum_{h=1}^{24} \left[\mathrm{SNC}_{\mathrm{VT}_{m,h}} \times \Delta\left(\mathrm{DAP}_{\mathrm{VTZ}_{m,h}}, \mathrm{ARTP}_{\mathrm{VTZ}_{m,h}}\right)\right] + \left(\mathrm{U}_{\mathrm{VT}} \times \mathrm{SNC}_{\mathrm{VT}_{m,h}}\right)$$

Where:

Variable	Description
$\mathrm{SNC}_{\mathrm{VT\$}}$	is the *IESO*-estimated daily cumulative submitted-but-not-cleared dollar exposure. This dollar value will be $0 for each trade date at the start of the *day-ahead market* submission window;
M	is the set of all virtual zonal trading entities
$\mathrm{SNC}_{\mathrm{VT}_{m,h}}$	is the absolute sum of submitted quantities of *bids* and *offers* submitted in respect of *virtual transactions* (in MWh) by *market participant* for *settlement* hour h at the virtual zonal trading entity m. The quantity (in MWh) will be zero for each trade date at the start of the *day-ahead market* submission window;
$\mathrm{DAP}_{\mathrm{VTZ}_{m,h}}, \mathrm{ARTP}_{\mathrm{VTZ}_{m,h}}$	is the *IESO*-determined price deltas calculated in accordance with section 5.3 of this *market manual*; and
U_{VT}	is the *virtual transaction* uplift estimation rate, in $/MWh. This is the *IESO's* estimation of *day-ahead market* reliability unit commitment uplift amounts that may be incurred by *virtual transaction offers* to provide *energy*.

5.2. Daily Monitoring of Virtual Transaction Actual Exposure and Trading Limit

(Market Rules: Chapter 2, section 5C.3.1)

Actual exposure for *virtual transactions* consists of all financially unsettled and settled *day-ahead market* transactions attributable to *market participants' virtual transactions*. The *IESO* calculates and accrues *market participants' actual exposure* for their *virtual transactions* from the start of a given *billing period* up to and including three *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*. The *IESO* monitors *market participants' actual exposure* for their *virtual transactions* against the *market participants' IESO*-determined *virtual transaction trading limit* on a daily basis. The amounts of *actual exposure* and *trading limit* for *virtual transactions* used for the daily monitoring by the *IESO* are available on the **Prudential Manager**.

The *IESO* takes into account *market participants' virtual transaction day-ahead market* activity when determining the components of *actual exposure* for *market participant*. The components of *actual exposure* for *virtual transactions* include:

- cleared-but-not-settled;
- settled-but-not-invoiced; and
- prepayments.

Similar to *physical transactions*, prepayment allows for the reduction in *actual exposure*. These prepayments can be either voluntary prepayments or *margin call* prepayments.

5.2.1. Cleared-but-Not-Settled Component for Virtual Transactions

The cleared-but-not-settled component includes the sum of a *market participant's bids* and *offers* submitted with respect to their *virtual transaction*s for the previous six consecutive rolling calendar days that have cleared the *day-ahead market* and the *real-time market* but have not yet been settled. The six calendar days of cleared-but-not-settled can be further broken down into the following two categories:

- *day-ahead market* cleared-but-not-settled; and
- *real-time market* cleared-but-not-settled.

5.2.1.1 Day-Ahead Market Cleared-but-Not-Settled Calculation for Virtual Transactions

A *market participant's day-ahead market* cleared-but-not-settled amount for *virtual transactions*, includes *virtual transaction day-ahead market* schedules and *IESO*-estimated virtual zonal trading entity price deltas as described in section 5.3 this *market manual*.

The *IESO* considers *market participants' bids* and *offers* for their *virtual transactions* to be cleared-but-not-settled in the *day-ahead market* until the virtual zonal *energy* prices become available from the *real-time market*.

5.2.1.2 Real-Time Market Cleared-but-Not-Settled Calculation for Virtual Transactions

A *market participant's real-time market* cleared-but-not-settled amount for *virtual transactions* is based on *virtual transaction day-ahead market schedules*, day-ahead virtual zonal *energy* price and hourly average real-time virtual zonal *energy* price.

The *IESO* calculates the cleared-but-not-settled amount for the *real-time market* once virtual zonal *energy* prices become available in the *real-time market*. For the cleared-but-not-settled calculation for the *real-time market*, the *IESO*-estimated price deltas are no longer required as the actual price deltas become available for the same location, day and hour as the *bid* and/or *offer.*

5.2.2. Settled-but-Not-Invoiced for Virtual Transactions

The settled-but-not-invoiced component includes the settled value of *virtual transactions* plus any associated *day-ahead market* reliability unit commitment uplift.

The *IESO* determines the amount of the settled-but-not-invoiced component of the *actual exposure* for *virtual transactions* for a *market participant* on a daily basis, based on that *market participant's* activity in the *day-ahead market* and *real-time market* covering any amount that has been settled but has not yet appeared on an *invoice*. The settled-but-not-invoiced amount includes:

- all *settlement amounts* used in the settled-but-not-invoiced component are hourly and non-hourly charges from the *market participants' preliminary settlement statements* and *final settlement statements*; and
- all amounts calculated from the time they are no longer cleared-but-not-settled to the time the amounts appear on a *preliminary settlement statement*.

The *IESO* calculates the settled-but-not-invoiced component of *actual exposure* using the following *settlement amounts*:

- Hourly Virtual Transaction Settlement Amount; and
- Day-Ahead Market Reliability Unit Commitment Uplift, which applies to *virtual transactions* to sell *energy* only.

For details on physical market *settlement statements*, refer to Market Manual 5: Settlements Part 5.5: Physical Markets Settlement Statements.

5.3. Price Delta for Daily Cumulative Submitted-but-Not-Cleared Dollar Exposure and Cleared-but-Not-Settled for Virtual Transactions

The *IESO* determines a price delta to calculate:

- the daily cumulative submitted-but-not-cleared dollar exposure; and
- the daily cleared-but-not-settled component of *actual exposure.*

Determining a price delta will include calculating a price delta for an interim period then calculating a price delta for an enduring period.

5.3.1. Enduring Price Delta for Daily Cumulative Submitted-but-Not-Cleared Dollar Exposure and Cleared-but-Not-Settled

The enduring price delta is used in the *IESO's* daily dollar exposure screening and is distinct from the price delta discussed at section 4.2.1 of this *market manual.* It is based on the absolute value of the difference between the day-ahead virtual zonal *energy* price and the hourly average real-time virtual zonal *energy* price calculated to the 97th percentile. This enduring price delta is observed for the 30 calendar days prior to the given *trading day* of the current year and 30 calendar days prior and after the same *trading day* and month for the prior 24 months for each of the virtual zones.

The *IESO* modifies the applicable enduring price delta if the price delta is not within 15% of the actual price differences within a *virtual transaction* zonal trading entity.

5.3.2. Interim Price Delta for Daily Cumulative Submitted-but-Not-Cleared Dollar Exposure and Cleared-but-Not-Settled

The *IESO* uses an interim price delta, until 25 months of hourly day-ahead virtual zonal *energy* prices and hourly average real-time virtual zonal *energy* prices are available for all virtual zones.

Similar to the enduring price delta noted above, the *IESO* uses the 97th percentile of interim price delta data to set the interim price delta for each of the virtual zones. The rolling data set used also corresponds to the same timelines as mentioned in the enduring price delta sub-section above. The circumstances where the *IESO* is required to review the interim price delta are the same as the circumstances used for the enduring price delta.

5.4. Margin Call Warnings and Margin Calls for Virtual Transactions

(Market Rules: Chapter 2, sections 5C.2.1, 5C.2.2 and 5C.4)

Table 5-1 summarizes the actions taken by the *IESO* based on a comparison of *market participants' trading limit* for *virtual transactions* and their *actual exposure* for *virtual transactions.*

Table 5-1: Actions Taken as a Result of Daily Monitoring of Virtual Transactions

Trading Limit – AE comparison	IESO Action	Market Participant Action
Actual exposure< 70 % *virtual transaction trading limit*	None	None
70% *trading limit* <= *actual exposure*< 100 % *trading limit*	The *IESO* issues a "Notice of Margin Call Warning" to *market participants* for their *virtual transactions* for the *day-ahead market* via a generic e-mail.	*Market participants* may make a cash payment to reduce a portion of any amounts payable to the *IESO* to reduce their *actual exposure* for *virtual transactions*, or take other appropriate actions to ensure that their *actual exposure* for *virtual transactions* does not reach their *trading limit* for *virtual*

Trading Limit – AE comparison	IESO Action	Market Participant Action
		transactions (Chapter 2, section 5C.2.1 of the *market rules*).
Actual exposure >= 100 % *trading limit*	The *IESO* issues a *margin call* via a generic e-mail to *market participants* when their *actual exposure* for their *virtual transactions* reaches or exceeds 100% of its *IESO*-determined *virtual transaction trading limit* The *IESO* will reject a *market participant's* subsequent bids and offers for the *market participant's virtual transactions*.	*Market participants* are required to satisfy a *margin call* by paying cash in an amount sufficient to reduce their *actual exposure* for *physical transactions* to no more than 75% of the *market participant's trading limit* for *physical transactions* (Chapter 2, section 5C.4.1 and 5C.4.2 of the *market rules*). Note, payment must be made by 4:00 pm eastern prevailing time ("EPT") on the second business day following the date of the *margin call* by a *market participant*. The *market participant's* ability to conduct *virtual transactions* will be reinstated after it brings its *actual exposure* for *virtual transactions* to at least the dollar equivalent of 75% of its *trading limit*.

Note, *market participants* can log on to the **Prudential Manager** located on the *IESO* portal to view *margin call* warnings and *margin call* details.

– End of Section –

6. Consolidated Process for Monitoring Physical Transactions and Virtual Transactions

(Market Rules: Chapter 2, section 5D)

Where a *market participant* is authorized to conduct both *physical transactions* and *virtual transactions*, the *IESO* monitors *market participants'* consolidated *actual exposure* against that *market participants'* consolidated *trading limit* (in dollars).

Market participants' consolidated *actual exposure* is determined as the sum of:

- *actual exposure* for *virtual transactions*; and
- *actual exposure* for *physical transactions*.

Market participants' consolidated *trading limit* is determined as the sum of the:

- *trading limit* for *virtual transactions*; and
- *trading limit* for *physical transactions*.

The *IESO* issues a Notice of Margin Call Warning to *market participants* via a generic e-mail, when a *market participant's* consolidated *actual exposure* reaches or exceeds 70% of its *IESO*-determined consolidated *trading limit* (in dollars).

The *IESO* issues a *margin call* to *market participants* when their consolidated *actual exposure* reaches or exceeds 100% of the sum of their consolidated *trading limit* (in dollars). *Market participants* that are authorized to conduct both *physical transactions* and *virtual transactions* will have their prepayment applied to their consolidated *actual exposure*. In addition, *market participants* that are authorized to conduct both *physical transactions* and *virtual transactions* will have their *bids* and *offers* in respect of their *virtual transactions* rejected in the event their consolidated *actual exposure* exceeds their consolidated *trading limit* (in dollars). Table 6-1 summarizes comparisons of daily monitoring of *actual exposure* and *trading limit* between *market participants* that are solely authorized to conduct *physical transactions* or solely authorized to conduct *virtual transactions* against *market participants* that are authorized to conduct both *physical transactions* and *virtual transactions*.

Table 6-1: Comparison of Monitoring Activities between Market Participants Authorized to Conduct Physical Transactions, Virtual Transactions, or Both

Activity	Authorized to Conduct either Physical Transactions or Virtual Transactions	Authorized to Conduct both Physical Transactions and Virtual Transactions
"Margin Call Warning Notification" and Margin Call	"Notice of Margin Call Warning" and *margin call* issued for *physical transactions* or *virtual transactions*	Consolidated "Notice of Margin Call Warning" and *margin call* issued for the sum of *actual exposure* for *physical transactions* and *actual exposure* for *virtual transactions* (Chapter 2, section 5D.2 of the *market rules)*.
Margin Call Warning and Margin Call Thresholds	"Notice of Margin Call Warning" issued when *actual exposure* for *physical transaction* or *actual exposure* for *virtual transactions* reaches 70% and is less than 100% of the *market participant*'s respective *trading limit* (in dollars). *Margin call* issued when *actual exposure* for *physical transactions* or *virtual transactions* equals or exceeds the *market participant's* respective *trading limit* (in dollars)	"Notice of Margin Call Warning" issued when consolidated *actual exposure* for *physical transaction* and *virtual transactions* reaches 70% and is less than 100% of the *market participant's* consolidated *trading limit* (in dollars) (Chapter 2, section 5D.3.1 of the *market rules*) *Margin call* issued when consolidated *actual*
Prepayment	Prepayments applied to *actual exposure* for *physical transactions* or to *actual exposure* for *virtual transactions*	Prepayment applied collectively to the consolidated *actual exposure* for *physical transactions* and *virtual transactions* (Chapter 2, section 5D.3.2 of the *market rules*)

Activity	**Authorized to Conduct either Physical Transactions or Virtual Transactions**	**Authorized to Conduct both Physical Transactions and Virtual Transactions**
Virtual Trading Privileges	The *IESO* will reject bids and offers from a *market participant* in respect of its *virtual transactions* when the *actual exposure* for a *market participant's virtual transactions* equals or exceeds its *virtual transaction trading limit* (in dollars).	The *IESO* will reject *bids* and *offers* from a *market participant* in respect of its *virtual transactions* when the consolidated *actual exposure* for a *market participant* equals or exceeds its consolidated *trading limit* (in dollars) (Chapter 2, section 5D.3.3 of the *market rules*)

– End of Section –

7. Event of Default

(Market Rules: Chapter 2, section 8)

Where the *IESO* issues a default notice or a *notice of intent to suspend*, it also:

- deems any *physical bilateral contract quantities* to be zero for the period from the date the *event of default* occurs until it is remedied if that *market participant* is the *selling market participant*; or
- rescinds or refuses to accept any initial or revised *physical bilateral contract* data relating to a *dispatch day* after the date of the *event of default* if that *market participant* is the *buying market participant.*

The process of default is addressed in Market Manual 5: Settlements Part 5.9: Payment Methods and Schedule, where this relates to non-payment of an *invoice* and in Market Manual 2: Market Administration Part 2.6: Treatment of Compliance Issues, where it relates to a compliance issue.

Refer to Market Manual 5: Settlements Part 5.3: Submission of Physical Bilateral Contract Data for more information on the Physical Bilateral Contract process.

7.1. Default Levy

If the *IESO* is unable to remedy an *event of default* using the posted *prudential support* by a defaulting *market participant*, the *IESO* is entitled to issue a *default levy* to all *non-defaulting market participants* that were participating in the *energy* markets at the time of the failure of payment of a *defaulting market participant* irrespective of whether the *event of default* occurred in the context of *physical transactions* or *virtual transactions*.

Following an *event of default*, the *IESO* has the authority to draw upon *market participants' prudential support* for both *physical transactions* and *virtual transactions* if a *market participant* has posted *prudential support* for both.

– End of Section –

8. Capacity Prudential Requirements

The *IESO* determines the *capacity prudential support* obligation for each *capacity market participant* for each *obligation period* based on a percentage of the monthly availability payment, less any allowable reductions.

The *IESO* calculates the *capacity prudential support* obligation as follows:

- [Monthly Availability Payment ($) × 50%] – Allowable Reductions

where:

- Monthly Availability Payment = Σ (*Capacity obligation(s)* for the *obligation* period × Zonal Clearing Price × 23 days).

All *capacity auction participants* with a *capacity obligation* are encouraged to post *prudential support* for the *obligation period*, at least 60 days prior to the *obligation period*.

The Prudential Requirements Contact has a task in Online IESO to submit the *capacity prudential support* information.

The *capacity prudential support* posted by *market participants* or *capacity market participants* to satisfy this obligation must be in the following format (Chapter 2, section 5.B.4.2 of the *market rules*):

- a guarantee or irrevocable commercial letter of credit, which is in a form acceptable to the *IESO* and provided by:
    - a bank named in a Schedule to the Bank Act, S.C. 1991, c.46 with a minimum Standard and Poor's long-term credit rating of "A" or equivalent from an *IESO* acceptable major bond rating agency; or
    - a credit union licensed by the Financial Services Commission of Ontario with a minimum Standard and Poor's long-term credit rating of "A" or equivalent from an *IESO* acceptable major bond rating agency.

There are two allowed reductions that may be used by *market participants* (if applicable) in order to reduce their *prudential support obligation* (Chapter 2, section 5B.5 of the *market rules*):

- reduction for credit rating; and
- good payment history reduction.

If *market participants* are currently utilizing reductions in the *physical market*, the reductions will be adjusted accordingly to not exceed the maximum allowable under the *market rules*.

The *capacity prudential support obligation* amount may increase depending on poor creditworthiness/ history in the *IESO* market.

In the case where a full or partial *capacity obligation transfer* is being requested:

- the *capacity transferee* must satisfy its *capacity prudential support obligation*, including any additional *capacity prudential support obligation* that may be required as a result of a transfer request, within 5 *business days* of receiving a notification from the *IESO* or within such longer period of time as may have been agreed to with the *IESO*.
- after the *capacity transferee* has satisfied the *capacity prudential support obligation* or revised *capacity prudential support obligation*, as applicable, the *IESO* will notify the *capacity transferor* of its approval or rejection of the transfer request. Upon receiving an approval notification, the *capacity transferor* may request the *IESO* to reassess its *capacity prudential support obligation*.

– End of Section –

Appendix B: Forms

This appendix contains a list of forms associated with the *prudential support market manual*, which are available on the *IESO*'s Web site (http://www.ieso.ca/). The forms included are listed in table A-1 below:

Table B-1: Forms

Form Name	Form Number	Description
Prudential Guarantee	IMP_GRNT_0001	Guarantee agreement to provide prudential support for *physical transactions* by the guarantor to the *IESO*.
Affidavit Regarding Reduction in Prudential Support Obligations	IESO_AFF_0001	Affidavit provided by a *market participant* that is a *distributor*, in respect of a claim of reduction to its *prudential support obligation* for its *physical transactions*.
Pledge of Cash and Treasury Bills	IESO_AGR_0013	Pledge of Cash and Treasury Bill as a form of *prudential support* between the pledger and the *IESO* to cover a *market participant's prudential support obligation* for its *physical transactions.*

– End of Section –

Appendix C: Credit Ratings

The reduction in the level of *prudential support obligation* relative to the *market participant's maximum net exposure* that can be applied by the *IESO* based on a *market participant's* credit rating is set out in the following tables (Chapter 2, section 5.8.1 and 5.8.1A of the *market rules*):

Table C-1: Credit Rating Reductions for Non-Distributors

Credit Rating with Standard and Poor's Rating Terminology	**Maximum allowable reduction in *Prudential Support* ($)**
AA- and above or equivalent	100% of maximum net exposure
A-, A, A+ or equivalent	Greater of 90% of *maximum net exposure* or $37,500,000
BBB-, BBB, BBB+ or equivalent	Greater of 65% of *maximum net exposure* or $15,000,000
BB-, BB, BB+ or equivalent	Greater of 30% of *maximum net exposure* or $4,500,000
Below BB- or equivalent	0

Table C-2: Credit Rating Reductions for Distributors

Credit Rating with Standard and Poor's Rating Terminology	**Maximum allowable reduction in *Prudential Support* ($)**
AA- and above or equivalent	100% of maximum net exposure
A-, A, A+ or equivalent	Greater of 95% of *maximum net exposure* or $45,000,000
BBB-, BBB, BBB+ or equivalent	Greater of 80% of *maximum net exposure* or $22,500,000
BB-, BB, BB+ or equivalent	Greater of 55% of *maximum net exposure* or $7,500,000
Below BB- or equivalent	0

– End of Section –

Appendix D: Good Payment History

Table D-1: Good Payment History Reductions for Non-Distributors

Good Payment History	Allowable Reduction in Prudential Support Obligation (for non-distributors)
Six years or more	The lesser of $12,000,000 or 50% of *maximum net exposure*
Five or more years but less than six years	The lesser of $7,500,000 or 30% of *maximum net exposure*
Four or more years but less than five years	The lesser of $6,000,000 or 25% of *maximum net exposure*
Three or more years but less than four years	The lesser of $4,500,000 or 20% of *maximum net exposure*
Two or more years but less than three years	The lesser of $3,000,000 or 15 % of *maximum net exposure*
Less than two years	$0

Table D-2: Good Payment History Reductions for Distributors

Good Payment History	Allowable Reduction in Prudential Support Obligation (for distributors)
Six or more years	The lesser of $14,000,000 or 80% of *maximum net exposure*
Five or more years but less than six years	The lesser of $9,000,000 or 65% of *maximum net exposure*
Four or more years but less than five years	The lesser of $7,500,000 or 45% of *maximum net exposure*
Three or more years but less than four years	The lesser of $6,000,000 or 35% of *maximum net exposure*
Two or more years but less than three years	The lesser of $4,500,000 or 25% of *maximum net exposure*
Less than two years	$0

– End of Section –

Appendix E: Global Adjustment Calculation for Minimum Trading Limit and Default Protection Amount

The *IESO* estimates global adjustment for *market participants* that are not *energy traders*. The global adjustment estimate is included as part of their *physical transaction minimum trading limit* and *default protection amount* calculation for the *IESO-administered markets*.

The *IESO* calculates the global adjustment 'Class B' estimate for a *market participant* that is not an *energy trader* as follows for its *prudential support obligation*:

> Global Adjustment (Class B) Minimum Trading Limit and Default Protection Amount calculation = Global Adjustment (Class B) price per MWh provided by the OEB x *Market participant*-provided daily quantity (in MWh) x # of days for Minimum Trading Limit or Default Protection Amount

The global adjustment price for a *market participant* that is not an *energy trader* stays static until the daily quantity of MWh injected or withdrawn for that *market participant* is changed or after conducting the annual review for global adjustment.

The *IESO* calculates the global adjustment 'Class A' estimate for a *market participant* that is not an *energy trader* as follows for its *prudential support obligation*:

> Global Adjustment (Class A) Minimum Trading Limit and Default Protection Amount calculation = (PDF[8] x Total Global Adjustment Dollars Forecasted by the OEB)/(*Market participant* provided Daily Maximum withdrawals in MWh x 365 days)

The Global Adjustment estimate for *market participants* is determined as the sum of the Class A and Class B Global Adjustment calculations.

– End of Section –

[8] PDF is the Peak Demand Factor assigned to each 'Class A' market participant based on their five coincident peak demands during a predetermined base period.