PUBLIC

Detailed Design

Market Renewal Program: Energy

Facility Registration

Detailed Design

Issue 2.0

This document provides a detailed overview of the processes related to Facility Registration 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
2.0	Second publication after considering external stakeholder feedback.	January 28, 2021

Related Documents

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

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Table of Changes

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 Facility Registration 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.

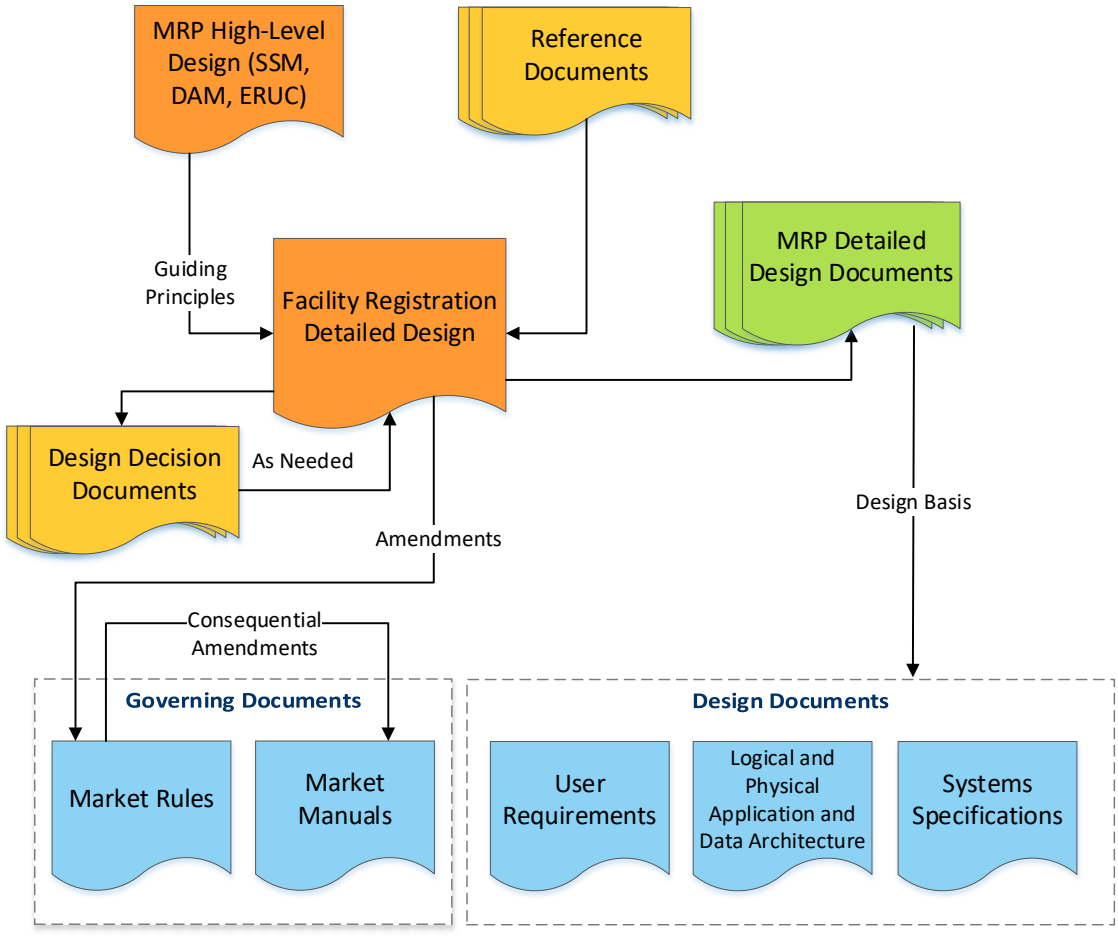

Figure 1-1: Detailed Design Document Relationships

1.2. Scope

This document describes the Facility Registration process for the future day-ahead market and *real-time market*, in terms of:

- detailed business design,
- supporting *market rule* 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 related to Facility Registration. However, this document is not meant as 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 Facility Registration 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 Section 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* Facility Registration process, and its future context for the future *real-time market* and day-ahead market (DAM);
- **Section 3** of this document provides a detailed description of the future Facility Registration process;
- **Section 4** of this document describes how the Facility Registration 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 Facility Registration process are expected to impact the market-facing manuals and 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 Facility Registration process described in Section 3. This section also outlines the logical boundaries and interfaces of the various sub-processes related to the Facility Registration 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

2.1. Facility Registration in Today's Market

The purpose of the Facility Registration process for today's market is to assess the *facility* information submitted by *market participants* prior to the connection of their *facilities* to the *IESO-controlled grid* (ICG) and participation in the day-ahead commitment process (DACP) and *real-time market.*

Before *market participants* can initiate the process for registering a *facility*, they must complete specific prerequisite sub-processes further described in the Authorization and Participation detailed design document.

The Facility Registration process involves the following sub-processes:

- Record Equipment – *market participants* submit the *facility* information to be registered and establish *market participant* owner, operator and *registered market participant* role relationships for the resources that will be used to participate in the market. *Demand response market participants* register either *dispatchable loads* or *hourly demand response* resources to fulfill their *demand response capacity obligations*[1] through the DACP and *real-time market*.
- *Market participants* may also register eligible dispatchable non-quick start (NQS) *generation facilities* for a day-ahead production cost guarantee (DA-PCG) and a real-time cost guarantee (RT-GCG). The DA-PCG and RT-GCG programs make these resources eligible for guarantee payments where they are committed in the DACP and pre-*dispatch* timeframes, respectively.
- Register Revenue Meter Installation – *market participant*s assign a *metered market participant* to satisfy the metering requirements for the *facility.*
- Prepare for Operations – *IESO* internal activities required to verify *facilities* and resources are ready to be connected to the *IESO-controlled grid* and participate in the *IESO-administered markets.*

[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*.

- Commission Equipment – *market participants* demonstrate the performance of the *registered facility* aligns with the registration information submitted by the *market participant.*

The Facility Registration process for a *facility* and a *boundary entity* ensures that:

- the *market participant* seeking to register a physical *facility* is authorized by the *IESO*;
- the owner, operator and *registered market participant* (RMP) for the *registered facility* is correctly identified;
- the requirements set out in the Connection Assessment process are completed prior to connection to the ICG;
- users for each *registered market participant* are set up to submit *dispatch data* for appropriate resources;
- each *registered facility* and *boundary entity* conforms to all applicable operating standards and *reliability* requirements;
- each *registered facility* and *boundary entity* complies with the monitoring and telecommunications requirements for operating in the *IESO-administered markets*; and
- a restoration plan is filed where needed.

The *Facility* Registration process provides various information services and products to processes within the *IESO* and to *market participants*. In particular, the following services are performed:

- assessing physical *facilities* and *boundary entities* to ensure that they adhere to established *reliability*, performance and technical standards as defined in the *market rules;*
- ensuring that the *IESO* information systems are updated with current *facility* and *boundary entity* status information; and
- providing a registration approval notification (RAN) to both the *IESO* staff and the *market participant* once registration requirements have been met.

In addition to registering a *facility*, there are provisions for existing *facilities* to either transfer to another *market participant* or be deregistered. *Market participants* must notify the *IESO* of their intent to transfer or deregister. The *IESO* verifies the following activities take place for each request:

- Transfer of *facilities – prudential support* equivalent to those covered by the existing owner of the *facility* must be in place before the ownership of the *facility* can be transferred to another *market participant*; and

- Deregistration of *facilities* - *IESO* determines if a technical assessment is required for a physical *facility* to be deregistered. This assessment is based on whether the removal of the *facility* will have an adverse impact on the *security* and *reliability* of the *IESO-controlled grid*.

All activities in the *IESO* Facility Registration process are governed by the *market rules* and the *participation agreement* that binds each *market participant* entity to those rules.

Figure 2-1 provides a high-level overview of the current Facility Registration process.

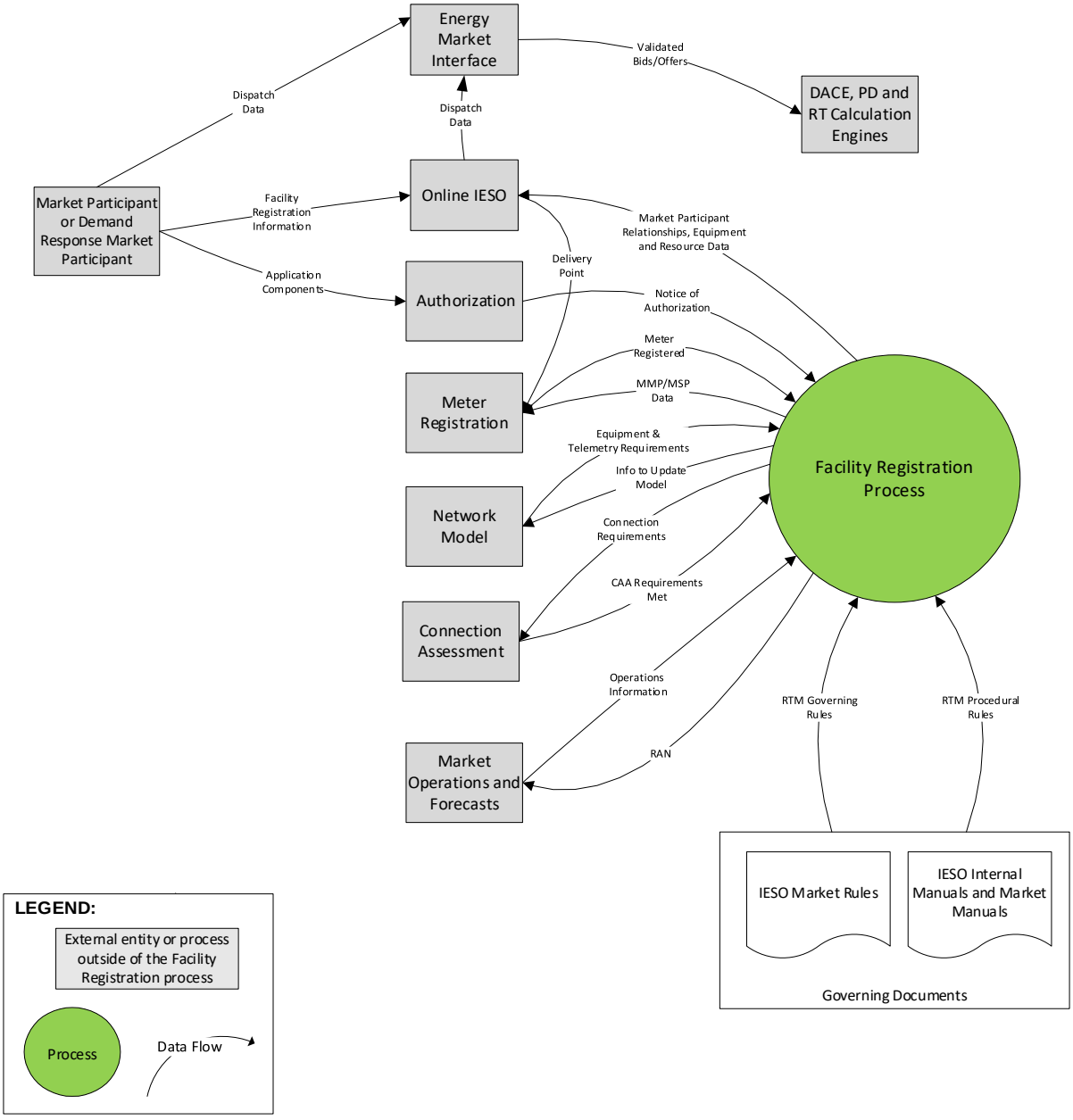

Figure 2-1: Current Facility Registration Process

2.2. Facility Registration in the Future Market

The Facility Registration process will continue to assess that the *market participant's facilities* are registered in accordance with the *market rules* and that the information required for receiving *bids* and *offers* and issuing *dispatch instructions* and *interchange schedules*, is included in the *IESO* market information systems.

The *IESO* market information systems validate all submissions by *market participants*, such as *bids* and *offers*, *dispatch data* and *physical bilateral contract data,* according to the participant authorization and *facility* registration information.

The future day-ahead market and *real-time market* will introduce a number of changes that will impact some of the sub-processes within the *Facility* Registration process. These changes are:

- A single schedule day-ahead market and *real-time-market* introduces changes to the Market Power Mitigation process;
- Virtual transaction *energy* traders will be included as a new *market participant* authorization type that will be authorized to submit virtual transaction *offers* and *bids* for *energy* in the day-ahead market only;
- *Market participants* will be able to submit *bids* for *energy* into the day-ahead market for *load facilities* registered as price responsive loads, but such *registered facilities* will remain non-dispatchable in real-time; and
- New *dispatch data* parameters will be introduced for *registered market participants* to submit for dispatchable non quick-start (NQS) and hydroelectric *generation facilities* into the day-ahead market and *pre-dispatch scheduling*.

The Record Equipment process will be updated to capture additional resource information for new and existing *generation facilities* and *load facilities* to support the changes described above. These changes are highlighted in the sub-sections below and further described in Section 3 of this document.

Changes to the Prepare for Operations process are essentially driven by the changes to the Record Equipment process, since new parameters and *market participant* authorization types will need to be verified before they can be approved for participation in the *IESO-administered market*.

The Register Revenue Meter Installation process will not change in the future market. Refer to the Revenue Meter Registration detailed design document for more information about this process.

The Commission Equipment process, which verifies the performance of the *registered facility* aligns with the registration information submitted by the *market participant,* will not change.

2.2.1. Registration for Generation Facilities

Generation facilities will continue to be registered as a *facility* type of either a *dispatchable generation facility* including *variable generators*, or a non-dispatchable *generation facility* which includes *self-scheduling generation facilities*, *intermittent generators*, and *transitional scheduling generators*.

While most of the existing resource registration requirements for *generation facilities* will not change, additional registration parameters will be required for dispatchable *generation facilities* to support the Market Power Mitigation process, *dispatch data* validation, and resource scheduling decisions in the DAM and PD calculation engines.

The ex-ante Market Power Mitigation process will require reference levels to be registered that correspond to financial *offer* parameters that *registered market participants* submit as *dispatch data.* Examples of financial *offer* parameters include speed no-load *offer* and start-up *offer*, as well as *offers* for *energy* and *operating reserve*. Reference levels for financial *offer* parameters will be updated by the *IESO* as required based on cost components relevant to each *offer* parameter.

Reference levels will also be registered for non-financial *dispatch data* parameters where applicable by season (summer and winter). Reference levels for non-financial *dispatch data* parameters will be based on an assessment of how the resource is reasonably capable of operating in a competitive environment rather than under operational limits. Some examples of non-financial *offer* parameters include *minimum loading point,* lead time and *energy* and *operating reserve* ramp rates.

The ex-post Market Power Mitigation process will require reference quantities to be registered for *dispatchable generation facilities* participating in the *energy* or the *operating reserve* markets. Reference quantities will be used to assess physical withholding after-the-fact.

The registered reference levels that will be determined for financial and non-financial *dispatch data* parameters are described in Section 3.7 of this document. For more information on how these reference levels will be determined and updated for financial and non-financial *dispatch data* parameters, refer to the Market Power Mitigation detailed design document.

Market participants will also be required to disclose any persons that have the ability to control or influence their *offer* and *bid* submissions, or follow their *dispatch instructions*. These organizations will be referred to as market control entities.

Dispatch data validation and day-ahead market and pre-*dispatch* calculation engine scheduling processes will utilize additional registration parameters for resources registered as a dispatchable hydroelectric *generation facility*. *Market participants* will have the option of registering:

- a new 'shared daily *energy* limit' parameter for hydroelectric *generating units* that share a common forebay;
- a new 'start indication value' parameter identifying a minimum MW value for each hydroelectric *generating unit(s)* associated with a resource that once reached represents a 'start' in the count of the *maximum number of starts per day* submitted as *dispatch data*;
- a new 'hourly must run' flag that identifies hydroelectric *generating units* with documented must run conditions that are eligible to have hourly must run quantities submitted as *dispatch data*;
- multiple *forbidden regions* that will now be used to validate *forbidden regions* submitted as *dispatch data* into the DAM, PD and RT calculation engines; and
- a new 'time lag' parameter that will replace the existing '*daily cascading hydroelectric dependency*' parameter. Time lag will be used to identify resources that would be eligible to submit cascade-specific dependencies as *dispatch data* and register time lag values to validate submission of time lag submitted as *dispatch data*.

The RT-GCG eligibility currently available to dispatchable NQS *generation facilities* will be replaced with a new generation *offer* guarantee (GOG). The GOG status will determine whether a NQS *generation facility* will be eligible for guarantee payments when the pre-*dispatch* calculation engine commits an eligible dispatchable NQS *generation facility* in the pre-*dispatch* timeframe. GOG eligibility requirements are further described in Sections 3.5.1 and 3.6.1.

The DA-PCG eligibility currently available to dispatchable NQS *generation facilities* will also be replaced with the GOG. Day-ahead market make-whole payments will apply to additional *facilities* and *intertie* transactions participating in the day-ahead market. Make-whole payment eligibility and calculations are fully described in the Market Settlement detailed design document. Existing registration information used for the RT-GCG and DA-PCG will be re-purposed or retired.

2.2.2. Registration for Load Facilities

With the introduction of a day-ahead market, *market participants* will be able to register their *load facilities* as price responsive loads. A new set of technical parameters similar to those parameters currently registered for *dispatchable loads*

will need to be registered for price responsive loads to participate in the day-ahead market.

Demand response market participants will now also be able to satisfy a *demand response capacity obligation* as a price responsive load by registering their physical *hourly demand response* resource as a price responsive load[2]. All other *facility* registration requirements for *hourly demand response* resources will not change.

Dispatchable loads participating in the *operating reserve markets* will be required to register their relevant reference levels and reference quantities.

As with *generation facilities,* market control entities will also be required to be disclosed for price responsive load, *dispatchable load* and physical and virtual *hourly demand response* resources.

2.2.3. Registration for Boundary Entities

Once a *market participant* becomes authorized to import *energy* into and export *energy* from the *IESO-controlled grid* as an *intertie* trader, there will be no new registration requirements. The *IESO* will continue to provide authorized *intertie* traders access to all *boundary entity* resources to submit export *bids* and import *offers* for *energy* and/or *operating reserve* at those *boundary entity* resources. *Intertie* traders will be able to submit their *offers* and *bids* into the day-ahead market as they currently can into the DACP.

Intertie traders will be required to disclose their market control entities during the Registration of Participation process. Refer to the Authorization and Participation detailed design document for additional information on this process.

2.2.4. Registration for Virtual Transaction Energy Traders

Similar to *intertie* traders, *market participant*s authorized to submit virtual transactions will have no *facility* registration requirements. The *IESO* will provide authorized virtual transaction *energy* traders access to submit *bids* and *offers* for *energy* at all virtual transaction zonal trading entities.

Virtual transaction *energy* traders will only be able to submit virtual transaction *offers* and *bids* for *energy* in the day-ahead market. They will not be able to provide *offers* for *operating reserve*.

Virtual transaction *energy* traders will be required to disclose their market control entities during the Registration of Participation process. Refer to the Authorization

[2] The physical *hourly demand response* resource and associated price responsive load resource will be registered as separate resources with separate *delivery points* at the same *connection point* to the ICG.

and Participation detailed design document for additional information on this process.

2.2.5. Registration for Transmission Facilities

There are no changes to Facility Registration process for transmission facilities as a result of the MRP.

Figure 2-2 provides a high-level overview of the future Facility Registration process.

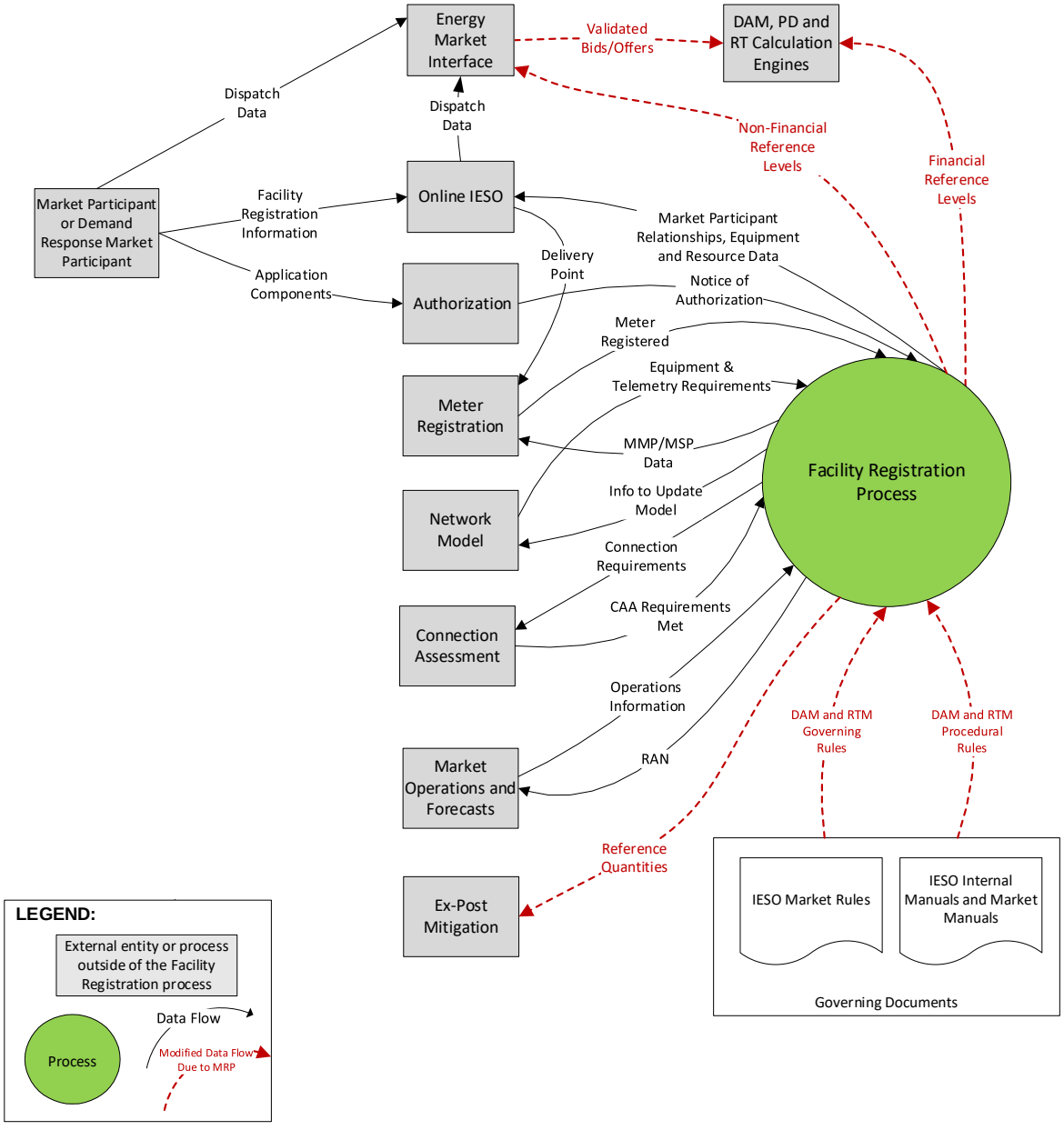

Figure 2-2: Future Facility Registration Process

– End of Section –

3. Detailed Functional Design

3.1. Structure of this Section

This section is sub-divided along the major topic areas that are relevant to the Facility Registration process. Over the course of this section, the design of the Facility Registration process will be described in terms of:

- Objectives;
- Prerequisites for Facility Registration;
- General Requirements for Facility Registration;
- Participation of Facilities in The Future Market;
- Resource Participation and Registration;
- Reference Levels and Reference Quantities for Market Power Mitigation;
- Facility Maintenance; and
- Facility De-Registration

These sub-sections will generally cover the major topic areas of the MRP high-level design and specifically, the design of the Facility Registration process in the context described in Section 2.2 of this document.

For the purposes of this document, registration of a 'resource' refers to parameters registered by a *market participant* for a resource within a *generation facility* or a *load facility*.

3.2. Objectives

The Facility Registration process for the future market is designed to meet the following objectives:

- Provide an updated process for *registered facilities* that continues to verify that the connection of those *facilities* does not have an adverse impact on the *IESO-controlled grid;* and
- Enable enhanced opportunities for supply-side and *demand*-side participation with the introduction of price responsive loads, virtual transaction *energy* traders, and new *dispatch data* parameters for dispatchable *generation facilities*.

3.3. Prerequisites for Facility Registration

Consistent with the current practice, an organization will be required to complete the following processes before registering a *facility* for participation in the future day-ahead market and *real-time market*:

- Participant Authorization – an organization must become authorized as a *market participant* through the Register Organization process and then become authorized for the appropriate *market participant* authorization type through the Registration of Participation process. Refer to the Authorization and Participation detailed design document for additional information on these processes.
- *Connection Assessment* – for each *facility* that a *market participant* intends to register, the *IESO* will assess the impact of connecting the *facility* to the *IESO-controlled grid*. The existing *Connection Assessment* process will not change in the future day-ahead market and *real-time market.* This process will continue to identify any required changes to the connection proposal or enhancements to the *transmission system* that will mitigate any potential adverse impact to the *IESO-controlled grid* or the new *facility*.

3.4. General Requirements for Facility Registration

The *IESO* mandates *facility* registration requirements to facilitate the effective and reliable operation of the *IESO-administered markets* and the *IESO-controlled grid*.

Market participants must meet *connection assessment* requirements, technical and equipment standards, communication and interoperability requirements for interacting with the *IESO*. The information required by the *Facility* Registration process includes *facility* characteristics, associated resources, and corresponding resource parameters.

Market participants will continue to submit their *facility* registration information by using Online IESO – a web-based registration system that guides *market participants* through the *Facility* Registration process until all of the registration activities applicable for the *facility* are completed.

- A *facility* will continue to be considered as officially registered when the *market participant* receives a final Registration Approval Notification (RAN) from the *IESO.* The final RAN allows the *facility* to connect to the *IESO-controlled grid* and participate in the *IESO-administered markets.* A RAN will also continue to be required for any changes to an existing *facility*.
- Prior to the final RAN, the *IESO* may issue interim RANs that clearly specify to the *market participant* the current registration status of a *facility*. For example, an interim RAN may only allow a *facility* whose registration status is

in-progress to be connected to the *IESO-controlled* for commissioning purposes but not for participation in the *IESO-administered markets*.

The Facility Registration process will continue to include the sub-process requirements described in the following sub-sections.

3.4.1. Record Equipment

The Record Equipment sub-process will continue to start with the assignment of an equipment registration specialist by the *market participant* that is the owner of the *facility.* The equipment registration specialist will be responsible for providing all equipment and corresponding equipment attributes for the *facility* on behalf of the *market participant.*

Once the *IESO* reviews and approves the submitted equipment information, the *IESO* will create resource records for the equipment that will be modelled in the *IESO* network model and used to participate in the *IESO-administered market.*

Registering Facility, Resource and Equipment Data

Online IESO will guide the equipment registration specialist to submit equipment attributes that are required for their *facility* to be registered. These data attributes include information about the physical equipment that will be connected to the *IESO-controlled grid* and information about the resources that will be used to participate in the *IESO-administered market.*

The set of physical equipment attributes currently registered will not change in the future day-ahead market and *real-time market.* These attributes are not described in this document however their descriptions can be found in the existing Register *Facility* Help File.

The set of attributes that will be modified are those related to resources used to participate in the future day-ahead market and *real-time market.* The modifications required for the registration of resource participation privileges and resource attributes are fully described in Sections 3.5, 3.6 and 3.7.

Organization Roles and Responsibilities

Table 3-1 describes the organization roles and responsibilities that will continue to be applicable for the Facility Registration process in the future day-ahead market and *real-time market.*

Table 3-1: Organization Roles and Responsibilities

Role	Responsibility
Owner	The *market participant* owning and maintaining the *facility* or the

Role	Responsibility
	demand response market participant responsible for fulfilling a *demand response capacity obligation*. The owner is responsible for registering the *facility* and assigning the *registered market participant*, *metered market participant* and operator relationships to their resources and equipment if applicable. The owner is also responsible for assigning an equipment registration specialist – a contact role that is responsible for registering *facility* resource and equipment information.
Registered market participant (RMP)	Uniquely designated for a resource, the RMP is the only *market participant* authorized to submit *dispatch data* for that particular resource. The RMP is also responsible for assigning RMP user-resource relationships that allow individual users to submit *dispatch data* for the assigned resource.
Metered market participant (MMP)	The *market participant* responsible for the financial *settlement* with the *IESO* of all quantities of *physical services* (including *energy* and *operating reserve*) related to *delivery point* for the resource as part of the *settlement process.* The MMP assigns any *metering service provider* (MSP) relationships to the *delivery point* for the resource. The *metered market participant* can continue to be different from the *registered market participant* associated with the resource*.*
Operator	The *market participant* responsible for the real-time operation of the *facility.*
Equipment registration specialist	A contact individual responsible for registering *facility* resource and equipment information and assigning specific *facility* contacts such as a: • 24/7 *facility* contact responsible for operating equipment; and • if applicable, a *facility* contact responsible for carrying out *dispatch instructions*.

Physical Facility – Resource Relationships

The Facility Registration process will continue to establish relationships between a physical *facility* and a resource for *dispatch algorithms* and *settlement* systems to work. For the purposes of this document, a physical *facility* refers to a *load facility* or *generation facility* site containing equipment such as *generation units* and loads. A resource will continue to be a unique *IESO* modelling representation of a part of

or an entire physical *facility*. A physical *facility* can continue to be represented by one or more resources.

The *IESO* will continue to assign the resource name, resource ID, and *delivery point* identifiers for each registered resource associated with a physical *facility*. These identifiers will be common to both the future day-ahead market and *real-time market*.

Table 3-2: Physical Facility Resource Identifiers

Resource Identifier	Description
Resource name	Resource name will continue to be used as a unique identifier for each registered resource across other *IESO* systems such as *Energy* Management Interface (EMI). This parameter will be used for *dispatch data* submission by the *registered market participant* into the DAM, PD and RT calculation engines for all *generation facilities, dispatchable loads* and physical and virtual *hourly demand response* resources. For price response loads, this parameter will be used for *dispatch data* submission by the *registered market participant* into the DAM calculation engine only.
Resource ID	Resource ID will continue to be a represent a unique numeric identifier for each resource name. It is often included in reports or communications to *market participants*.
Delivery point	As with today's *real-time market,* the *delivery point* will be used as a unique identifier that the *settlement process* at *IESO* will use for the *settlement* of resources in the future day-ahead market and *real-time market*. This parameter will continue to have a one-to-one relationship with the resource name.

Market Participant – Resource Relationships

The Facility Registration process will continue to establish relationships between *market participants* and registered resources associated with a physical *facility*. Each resource associated with a physical *facility* may have relationships to several different *market participants*. However, each relationship must be unique. For example, if one *market participant* has been designated as the *metered market participant* for one resource, a different *market participant* cannot be designated as the *metered market participant* for that same resource.

A single *market participant* may continue to fill one, more, or all of the roles, depending on its qualifications and responsibilities. The following relationships are possible for a specific resource:

Table 3-3: Market Participant Resource Relationships

Role	Resource Relationship
Owner	One-to-one relationship with the resource.
Registered market participant (RMP)	One-to-one relationship with the resource that must be the same for day-ahead market and *real-time market.* • Many-to-one individual user to RMP relationships with resource for the day-ahead market that may be different than the RMP users designated for the same resource in the *real-time market.*
Metered market participant (MMP)	One-to-one relationship with *delivery point* that must be the same for day-ahead market and *real-time market.*
Metering service provider (MSP)	One-to-one relationship with *metering installation* for each *delivery point* that must be the same for day-ahead market and *real-time market.*
Operator	One-to-one relationship with the resource.

3.4.2. Register Revenue Meter Installation

Once the physical *facility* and associated resource names are registered and a *delivery point* relationship is established with a *metered market participant, the metered market participant* will assign a *metering service provider* to satisfy the metering requirements for the *facility*. Refer to the Revenue Meter Registration detailed design document for more information regarding the Register Revenue Meter Installation process in the future day-ahead market and *real-time market*.

3.4.3. Prepare for Operations

After the *IESO* verifies the *facility* registration information submitted by the *market participant,* the *IESO* will continue to complete a series of internal activities that are required to consider the *facility* as registered. The *IESO* activities performed by the Prepare for Operations process include, but are not limited to:

- reviewing and accepting the *connection agreement* for the *facility*;
- establishing *outage* reporting requirements for the *facility* with the *market participant*;

- building network models and establishing any new or modified operating *security limits* as required;
- testing operational telemetering and communications, *dispatch workstation* functionality and voice communications with the *market participant*; and
- configuring *settlement* systems.

The Prepare for Operations process will be updated to include communication and *participant workstation* requirements to support the introduction of price responsive loads and virtual transaction *energy* traders into the future day-ahead market. These updates are described in the following sub-sections.

Voice Communications, Monitoring and Control

Voice communication requirements will continue to be governed by Chapter 2, Appendix 2.2 of the *market rules* for registered *generation facilities, wholesale customer facilities,* distribution *facilities* and transmission *facilities.* These requirements are driven by the production or consumption capability of the *facility*, restoration requirements and in the case of a *generation facility,* those registered for *black start capability*. These requirements will not change for existing *facilities* in the future day-ahead market and *real-time market*. Price responsive loads will be subject to the voice communication requirements that currently apply to *non-dispatchable loads.*

Operational telemetry quantities and performance standards requirements will continue to be governed by the Chapter 4 Appendices of the *market rules* for dispatchable *generation facilities, dispatchable loads,* transmission *facilities,* distribution *facilities* and *ancillary service providers*. These requirements will not change for existing *facilities* in the future day-ahead market and *real-time market*. Price responsive loads will be subject to the operational telemetry requirements that currently apply to *non-dispatchable loads.*

Market participants registering *generation facilities* and *load facilities* will continue to be required to provide, maintain and connect to each of its *facilities,* monitoring and control devices that meet the specifications and other requirements set forth in the *participant technical reference manual.* Price responsive loads will be subject to the monitoring and control requirements that currently apply to *non-dispatchable loads.*

Virtual transaction *energy* traders will not be subject to any voice communication requirements, operational telemetry requirements or monitoring and control requirements.

Participant Workstations and Dispatch Workstations

A *participant workstation* is any client computer or server that a *market participant* uses to communicate information with or conduct *IESO-administered market* transactions with *IESO* systems.

Participant workstation testing is required by the *IESO* to verify that *market participants* can communicate with the *IESO* and that their *participant workstations* comply with all applicable technical requirements in the *participant technical reference manual* for non-real time data transfers.

Virtual transaction *energy* traders and *market participant* registering resources associated with a price responsive load will be required to install, test and maintain a *participant workstation* that allows for *dispatch data* to be submitted into the day-ahead market via the EMI.

Only *market participants* registering resources associated with a dispatchable *generation facility* or a *dispatchable load* will continue to be required to install, test and maintain a *dispatch workstation* that meets the requirements in the *participant technical reference manual* for real-time data transfers.

3.4.4. Commission Equipment

This process will not change for the future day-ahead and *real-time market.* The *market participant* will continue to be required to demonstrate to the *IESO* that the performance of the *registered facility* aligns with the registration information submitted by the *market participant*. This stage will continue to apply for new *facilities* or changes to the performance characteristics of existing *facilities. Market participants* will continue to be required to update their registration information if the *IESO* determines the *registered facility* fails performance validation.

As part of the maintenance requirements, *market participant*s must report any changes to the operational data, market data or physical data for a *registered facility*, resource or equipment to the *IESO*. This may trigger additional *IESO* assessments, internal processes and subsequent *market participant* notifications.

3.5. Participation of Facilities in the Future Market

In the future day-ahead market and *real-time market, facilities* will continue to be defined as *generation facilities*, *load facilities*, *transmission systems* and *distribution systems* within the *IESO control area*, and any other equipment that is a component or part of the *electricity system*.

An *electricity system* will continue to be defined as the *integrated power system* and all *registered facilities* connected to that system. *Registered facilities* will continue to be defined as *facilities* and *boundary entities* capable of supplying or withdrawing *physical services.*

The *IESO* will continue to require that *market participants* register all of the following *facilities*:

- *generation facilities* with a minimum rated *generation capacity*, net of auxiliary requirements, greater than or equal to 1MW;
- *load facilities* with a minimum load capacity is greater than or equal 1MW;
- *distribution systems* with a minimum load capacity greater than or equal to 1MW; and
- transmission facilities.

The following sub-sections describe how *facilities* will be registered as resources to participate in the future day-ahead market and *real-time market.*

3.5.1. Generation Facilities

Generation facilities are registered to participate in the *real-time market* as generation resources with one of two general *bid/offer* type designations – a dispatchable *generation facility* including *variable generation* or a non-dispatchable *generation facility* including *self-scheduling generation facilities, intermittent generators* and *transitional scheduling generators*. These *bid/offer* type designations will not change in the future to receive financially binding schedules in the day-ahead market, and to receive pre-*dispatch* schedules and *dispatch instructions* in the *real-time market.*

Generation facilities with multiple *generation units* can continue to be aggregated into a single generation resource as they are today, unless the *market participant* elects the *generation units* to be modelled as a *pseudo-unit* resource type for the purposes of *dispatch data* submission.

Pseudo-units will continue to be used to model the relationship between combustion turbine *generation units* and steam turbine *generation units* only if they are registered as dispatchable NQS combined cycle *generation facilities*. *Market participants* can currently elect for *registered market participants* to submit *dispatch data* for *pseudo-units* only in the DACP.

In the future day-ahead market and *real-time market, registered market participants* will be able to submit *dispatch data* for *pseudo-units* into the day-ahead market, pre-*dispatch* scheduling process and the *real-time market*.

The *IESO* will continue to create *pseudo-unit* resources based on the combustion turbine *generation unit(s)* and steam turbine *generation unit* relationships registered by the *market participant.* Each *pseudo-unit* will continue to consist of one combustion turbine *generation unit* and its associated steam turbine *generation unit*. Consistent with the treatment under the current DACP, combined cycle

generation facility relationship data for *pseudo-units* will be used in the day-ahead market, pre-*dispatch* scheduling process and the *real-time market* to:

- calculate *pseudo-unit* daily *dispatch data* values from daily *dispatch data* submissions for combustion turbine and steam turbine *generation unit* resources;
- allocate de-rating and transmission limitations for the combustion turbine and steam turbine *generation unit* resources to the *pseudo-unit;* and
- translate *pseudo-unit* schedules and *dispatch instructions* to combustion turbine and steam turbine *generation unit* resource level.

Compliance Aggregation

Compliance aggregation will continue to be defined as the ability of *market participants* to collectively meet *dispatch instructions* between two or more registered *generation facilities* when system conditions permit. *Market participants* will continue to be able to apply for compliance aggregation in the future *real-time market* as they do for the current *real-time market.*

The request for aggregation will continue to be subject to *IESO* approval based on whether the resources share operational dependencies such as cascade river dependencies or combustion/steam turbine dependencies, and the likelihood that the resource will frequently be sent unit-specific *dispatch instructions* to respect *security limits*.

NQS *generation facilities* will continue to be restricted in their use of compliance aggregation in the *real-time market.* A generation resource that also provides *regulation* may continue to be subject to additional restrictions.

With the introduction of *pseudo-units* in the future *real-time market,* NQS *generation facilities* registered as *pseudo-units* will be permitted to use compliance aggregation when following *dispatch instructions* below MLP. Refer to Section 3.7.2.3 in the Grid and Market Operations Integration detailed design document for more information about compliance to *dispatch instructions*.

Start-Up Offer and Speed-No-Load Offer Eligibility Declaration

Currently, *market participants* intending to submit *start-up costs* and *speed no-load costs* as *dispatch data* parameters into the DACP must submit a declaration through Online IESO. This declaration provides the *registered market participant* with submission and retrieval permissions for these two *dispatch data* parameters via the EMI.

In the future day-ahead market and *real-time market*, start-up offers will replace *start-up costs* and speed-no-load offers will replace *speed-no-load costs.* The *market participant's* declaration of intent to submit these two *offer* parameters as

dispatch data will be expanded to included submission into the day-ahead market and pre-*dispatch* calculation engines.

Registered market participants will also be able to submit three start-up *offer* values instead of one value for every *dispatch hour* of a *dispatch day* that can vary from hour to hour. These three values will represent the *offers* associated with starting a *generation unit* when it is hot, warm or cold. Refer to the Offers, Bids and Data Inputs detailed design document for more information regarding the submission of *dispatch data*.

Registered market participants will continue to only be eligible to declare their intent to submit start-up offers and speed no-load *offer* for *generation units* and *pseudo-units* associated with a dispatchable NQS *generation facility*. This declaration will now require reference levels to be established by the *IESO* for the *market participant's* start-up *offer* and speed-no-load *offer* submissions as *dispatch data.* A *market participant* will not be permitted to submit this *dispatch data* into the day-ahead market and pre-dispatch scheduling process until the corresponding reference levels have been established. Refer to Section 3.7 for more information regarding reference level registration requirements for these and other financial and non-financial *offer* parameters.

Changes to this declaration will continue to be communicated via Online IESO and the *registered market participant* will be provided with instructions to use the *offer* template file version that either includes or excludes the start-up *offer* and speed no-load *offer* parameters.

Generator Offer Guarantee Eligibility

The generator *offer* guarantee (GOG) will be a new registration status that represents whether a resource registered as a dispatchable NQS *generation facility* will be eligible for guarantee payments when the pre-dispatch calculation engine commits the *facility* in the pre-dispatch timeframe. The GOG status will replace the current real-time generator cost guarantee (RT-GCG) and day-ahead production cost guarantee (DA-PCG) statuses in the future market.

Market participants will be eligible for the GOG status if they register the following information for their dispatchable NQS *generation facility*:

- an *elapsed time to dispatch* greater than sixty minutes;
- a *minimum loading point* greater than zero;
- a *minimum generation block run-time* (MGBRT) greater than one hour; and
- a primary or secondary fuel type that is not uranium.

The *IESO* will process GOG status requests within 10 *business days* of receipt. Refer to the Market Settlement detailed design document for more information regarding the guarantee payment calculations for GOG-eligible *facilities.*

Variable Generation

Variable generation will continue to be registered as dispatchable *generation facilities* submitting all registration parameters currently required for wind and solar photovoltaic resources. *Market participants* with *variable generation* resources may elect to participate in the future day-ahead market through the submission of *energy offer* quantities and prices.

Variable generation may be *facilities* directly connected to the *IESO-controlled grid* or *facilities* embedded in the *distribution system*. The current Facility Registration process for these *registered facilities* to establish the resource name, resource ID, *registered market participant* (RMP), *metered market participant* (MMP) and *registered wholesale meter (RWM)* metered by the *IESO* will not change. The *registered market participant* for such *variable generation* resources may submit *dispatch data* into the day-ahead market. The election to submit *energy offers* or to utilize the *IESO's* centralized *variable generation* forecast will be specified by the use of the new *dispatch data* parameter known as the variable generator forecast quantity. Refer to the Offers, Bids and Data Inputs detailed design document for more information on *energy offer* submission in the future day-ahead market for *variable generation*.

Wind and solar photovoltaic resources with an installed capacity of 5MW or greater that are not metered by the *IESO* with a *registered wholesale meter* will not participate in the future day-ahead market and *real-time market*. Such *variable generation* connected through the *distribution system* will continue to provide operational and meteorological monitoring data for centralized forecasting.

3.5.2. Load Facilities

Load facilities are currently registered to participate in the *real-time market* as load resources with one of two *bid/offer* type designations – a *dispatchable load* or a *non-dispatchable load*. A new *bid/offer* type designation will be introduced to allow *market participants* registering a *load facility* as a price responsive load to submit *energy* bids into the future day-ahead market.

Dispatchable load facilities with multiple loads can continue to be aggregated into a single *dispatchable load* resource as they are today. Each *dispatchable load* resource will continue to be modelled discretely in the *IESO's* network model and revenue metered separately.

The aggregation, network modelling and *revenue metering* rules for *dispatchable loads* will also be available to *market participants* registering their *load facilities* as price responsive loads.

Demand Response Resources

Demand response market participants will continue to be required to fulfill their *demand response capacity obligation* in the electrical zone they received a *demand response capacity obligation.* The electrical zones will continue to be defined as either the West, Southwest, Bruce, Niagara, Toronto, East, Ottawa, Essa, Northwest and Northeast electrical zones.

Demand response market participants can fulfill their *demand response capacity obligation* in the future day-ahead market and *real-time market* by registering as either a *dispatchable load,* a physical *hourly demand response* resource or a virtual *hourly demand response* resource.

Consistent with the current DACP and *real-time market*, *registered market participants* will be required to submit *dispatch data* for the resource type registered to fulfill a *demand response capacity obligation* into the future day-ahead market and *real-time market*[3].

Dispatchable Loads

There will be no new registration requirements for a *dispatchable load* to fulfill a *demand response capacity obligation* in the future day-ahead market and *real-time market.*

Physical Hourly Demand Response Resources

A physical *hourly demand response* resource can continue to be registered to fulfill a *demand response capacity obligation* as a *non-dispatchable load*. If multiple physical *hourly demand response* resources are registered to fulfill a physical *demand response capacity obligation*, all of the *hourly demand response* resources must continue to have the same *metered market participant*. The *metered market participant* that is responsible for the *settlement* of a *demand response capacity obligation* for the *hourly demand response* resource can continue to be different from the *metered market participant* that is responsible for the *energy* market *settlement* for the *non-dispatchable load*.

The *IESO* will continue to assign the resource name, resource ID, and *delivery point* identifiers for each physical *hourly demand response* resource.

[3] *Dispatch data* for a physical *hourly demand response* resource associated with a price responsive load will have a *bid* for the demand response that is separate from the price responsive load *bid* for *energy*.

In the future day-ahead market and *real-time market*, *demand response market participants* will also be able to register their physical *hourly demand response* resource as a price responsive load[4].

All physical *hourly demand response* resources registered to fulfill a physical *demand response capacity obligation* as a price responsive load must have the same *registered market participant* and *metered market participant* as the price responsive load resource.

Each physical *hourly demand response* resource will continue to be modelled discretely at the same location at which the *non-dispatchable load* or price responsive load resource is modelled in the *IESO's* network model.

Virtual Hourly Demand Response Resources

A virtual *hourly demand response* resource can continue to only be registered to fulfill a virtual *demand response capacity obligation* with *non-dispatchable loads* and/or virtual contributors that are not metered with the *IESO.* As with *dispatchable loads* today, a price responsive load will not be able to register as a contributor to a virtual *hourly demand response* resource. Conditional on modifications being made to the capacity auction design, design changes would be required in the *energy* market to enable a price responsive load to register as a virtual *hourly demand response* resource.

A *demand response market participant* fulfilling a virtual *demand response capacity obligation* with contributors that are not *revenue metered* with the *IESO* must continue to register only one virtual *hourly demand response* resource per electrical zone, per load type (residential or commercial/ industrial/ institutional load type, as applicable). The *IESO* will continue to assign the resource name, resource ID, and *delivery point* identifiers for each virtual *hourly demand response* resource.

A *demand response market participant* fulfilling a virtual *demand response capacity obligation* with both, residential and commercial/ industrial/ institutional, non-revenue metered contributors in the same electrical zone must continue to register two separate virtual *hourly demand response* resources in that zone (one for each load type).

As part of the contributor management registration process, the *demand response market participant* must submit via Online IESO certain information for each contributor that will be associated with their registered virtual *hourly demand response* resources.

[4] The physical *hourly demand response* resource and associated price responsive load resource will be registered as separate resources with separate *delivery points* at the same *connection point* to the ICG.

All virtual *hourly demand response* resources registered to fulfill a virtual *demand response capacity obligation* in a given electrical zone will continue to be modelled discretely at the same location in the *IESO's* network model for that electrical zone. The exact network modelling location for each electrical zone will continue to be determined the *IESO.*

3.5.3. Facilities with Storage Capability

Facilities with storage capability such as batteries, flywheels and pump generating stations (PGS) may be scheduled in withdrawal or injection modes. A *facility* with storage capability is currently registered and modelled as a separate generation resource and a separate load resources at a single *facility*. No changes to the current registration and modelling of *facilities* with storage capability are required for the future day-ahead market and *real-time market.*

Generation and load resources at a *facility* with storage capability that are registered as dispatchable *generation facilities* and *dispatchable loads* would continue to also be eligible to provide *offers* for *operating reserve*.

3.5.4. Facilities Contracted to Provide Ancillary Services

The *IESO* will continue to contract for four *ancillary services* to help ensure the reliable operation of the power system in the future day-ahead market and *real-time market*. These *contracted ancillary services* include: certified black start *facilities*, *regulation* service, *reactive support services* and *voltage control services*, and *reliability must-run resources*.

Certified Black Start Facilities

Certified black start *facilities* are *generation facilities* able to restart with no outside source of power. In the event of a system-wide blackout, black start *facilities* would be called on during restoration efforts by helping to re-energize other portions of the *integrated power system*. *Generation facilities* that are contracted to provide *black start capability* will have no new *generation facility* registration requirements in the future market.

Regulation Service

Regulation service acts to match total system generation to total system *demand* and helps correct variations in power system frequency. A *regulation* service contract binds *generation facilities, load facilities and facilities* with storage capabilities to adjust their production or consumption based on *regulation* signals to provide frequency control and to maintain load balance.

Facilities with *regulation* signal capabilities like *automatic generation control (AGC)* will continue to be eligible to provide *regulation* service in the future day-ahead

market and *real-time market*. *Facilities* registered to provide *regulation* service in the current *real-time market* will be automatically registered to provide *regulation* service in the future day-ahead market.

The *IESO* will continue to use the existing AGC *energy* market registration parameter in the Facility Registration process to identify generation resources and load resources that are contracted to provide *regulation* service.

Reactive Support Service and Voltage Control Service

All generation facilities that are injecting *energy* into the *IESO-controlled grid* are required to provide *reactive support service* and *voltage control service* in accordance with the *market rule*s. When *generation facilities* are not injecting *energy*, the *IESO* will call on *generation facilities*, as required, to provide *reactive support service* and *voltage control service* under contract. There will continue to be no incremental registration requirements for *generation facilities* contracted to provide these services in the future *real-time market*.

Reliability Must Run

Reliability must-run contracts allow the *IESO* to call on *registered generation facilities*, *dispatchable loads* and *boundary entities* under contract to maintain the *reliability* of the *IESO-controlled grid*. As with the current market, *reliability* must run contracts will continue to be used to obligate a *registered market participant* to submit *dispatch data* into the future day-ahead market and *real-time market*. There will be no incremental registration requirements for registered facilities contracted as *reliability must-run resources* in the future day-ahead market and *real-time market*.

3.5.5. Boundary Entities

A *boundary entity* will continue to be defined as the capacity of one or more external resources located in an *intertie zone* that a *market participant* is authorized to import *energy* or provide *operating reserve* to, or export *energy* from, the *IESO-controlled grid*.

*Market participant*s will continue to seek authorization from the *IESO* to become an *intertie* trader and engage in import and export activities in the future day-ahead market and *real-time market* through the Register Organization process and Registration of Participation process. Refer to the Authorization and Participation detailed design document for information about these processes.

Once authorized, the *market participant* will continue to be granted access to submit export *bids* for *energy* and import *offers* for *energy* and *operating reserve* for all *boundary entities* designated by the *IESO* into the future day-ahead market and *real-time market. Boundary entities* will continue to be modelled by the *IESO* at

the same locations in the network model today. As with the current practice, no additional registration information is required for *market participants* authorized as *intertie* traders.

3.5.6. Virtual Transaction Zonal Trading Entities

Market participants will seek authorization from the *IESO* to become a virtual transaction *energy* trader through the Register Organization process and Registration of Participation process. Refer to the Authorization and Participation detailed design document for information about these processes.

Once authorized, the *market participant* will be granted access to submit virtual transaction *bids* and *offers* for *energy* only in the day-ahead market at all *IESO*-defined locations known as virtual transaction zonal trading entities. Nine virtual transaction zonal trading entities will be designated and maintained by the *IESO.* The nine virtual transaction zonal trading entities will be defined as:

- Northwest virtual transaction trading zone, representing all *load facilities* within the Northwest electrical zone;
- Northeast virtual transaction trading zone, representing all *load facilities* within the Northeast electrical zone;
- Essa virtual transaction trading zone, representing all *load facilities* within the Essa electrical zone;
- Ottawa virtual transaction trading zone, representing all *load facilities* within the Ottawa electrical zone;
- East virtual transaction trading zone, representing all *load facilities* within the East electrical zone;
- Toronto virtual transaction trading zone, representing all *load facilities* within the Toronto electrical zone;
- Southwest virtual transaction trading zone, representing all *load facilities* within the Bruce and Southwest electrical zones;
- Niagara virtual transaction trading zone, representing all *load facilities* within the Niagara electrical zone; and
- West virtual transaction trading zone, representing all *load facilities* within the West electrical zone.

Once access to these nine virtual transaction zonal trading entities are established, there will be no additional registration information required for virtual transaction *energy* traders.

3.5.7. Transmission Facilities

There will be no changes to the Facility Registration process for transmission *facilities* in the future day-ahead market and *real-time market*. There will continue to be no resource registration requirements for transmission *facilities*.

3.5.8. Capacity Exports

Capacity sellers will continue to be required to register capacity export information with the *IESO* after issuance of an approval, or a partial approval, to pursue a *capacity export request* with an entity in an external *control area*.

The following capacity export information must be provided by a *market participant* no later than the notification date provided by the *IESO* after a *capacity export request* has been approved by the *IESO*.

- the external *control area* to which Ontario-based capacity has been committed;
- the *generation facility* within the *IESO-controlled grid* providing capacity;
- the period for which capacity has been committed; and
- the quantity of capacity committed in MW.

3.6. Resource Participation and Registration

Market participants authorized as *generators* or *wholesale customers* will continue to register their *facilities* for participation in the future day-ahead market and *real-time market* as either generation resources or load resources. Any existing or new resources registered for participation in the *real-time market* will automatically be registered for participation in the day-ahead market.

Market participants authorized as *intertie* traders will continue to have no resource registration requirements for *boundary entities*. They will continue to be granted access to all resources designated by the *IESO* as *boundary entities*.

Similarly, *market participants* authorized as virtual transaction *energy* traders will not have any resource registration requirements. Instead, virtual transaction *energy* traders will be granted access to submit *energy offers* and *bids* into the day-ahead market for all resources designated by the *IESO* as virtual transaction zonal trading entities.

The registration of *generation facilities* and *load facilities* will continue to apply to all *market participants* that intend to register their *facilities* to supply *energy* and *operating reserve*, withdraw *energy* or provide *demand response* in the *IESO-administered markets*. All *facilities* that are registered to provide these products or services in the *real-time market* will automatically be registered to provide in the same products and services in the day-ahead market. The registration requirements

for these *facilities* will include many of the existing parameters and some new ones. The specific registration requirements for these *facilities* will be described in following sub-sections.

Table 3-4 summarizes the resource types that can be registered to participate in the future day-ahead market and *real-time market,* their corresponding *bid/offer* types and the trading privileges they are eligible for.

Table 3-4: Resource Types Used for Participation in the DAM and Real-Time Market

Resource Type	Bid/Offer Type	Demand Response Resource Dispatch Type	Eligible Products and Services	Energy Market Access
Generation	Dispatchable *generation facility*	N/A	• *Energy* • All classes of *operating reserve* • *Regulation* • *Reactive support services* and *voltage control services*	Day-ahead market and *real-time market*
	Self-scheduling generation facility	N/A	• *Energy* • *Reactive support services* and *voltage control services*	Day-ahead market and *real-time market*
	Intermittent generator	N/A	• *Energy* • *Reactive support services* and *voltage control services*	Day-ahead market and *real-time market*
Load	*Dispatchable load*	N/A	• *Energy* • All classes of *operating reserve*	Day-ahead market and *real-time market*

Resource Type	Bid/Offer Type	Demand Response Resource Dispatch Type	Eligible Products and Services	Energy Market Access
	Non-dispatchable load	N/A	• Not applicable	Not applicable
	Price responsive load	N/A	• *Energy*	Day-ahead market
Demand Response	*Dispatchable load*	5-minute	• *Demand* response	Day-ahead market and *real-time market*
	Non-dispatchable load	Hourly	• *Demand response capacity*	Day-ahead market and *real-time market*
	Price responsive load	Hourly	• *Demand response capacity*	Day-ahead market and *real-time market*
Boundary Entity	N/A	N/A	• *Energy* • 10-minute non-synchronized and 30-minute *operating reserve* (only imports)	Day-ahead market and *real-time market*
Virtual Transaction Zonal Trading Entity	N/A	N/A	• *Energy*	Day-ahead market

3.6.1. Generation Resource Registration Parameters

Table 3-5 describes the resource registration parameters that apply to the various types of *generation facilities* that can participate in the future day-ahead market and *real-time market.* These parameters are used by *IESO* tools and processes to support *dispatch data* validation, scheduling and *dispatch* decisions and *settlement* in the future day-ahead market and *real-time market*.

These parameters are determined after the *IESO*-determined resource identifiers and *market participant*-resource relationships are established as described in Section 3.4.1. 'MP' denotes that the equipment registration specialist assigned by the *market participant* is responsible for providing the registered data and '*IESO*' denotes that the *IESO* determines the registration data based on other equipment information provided by the equipment registration specialist. Descriptions for each parameter follow the table.

Table 3-5: Generation Resource Registration Parameters

Registration Parameter	Existing or New	Mandatory or Optional	Provided/Determined by (MP or *IESO*)	Generation Resource Type					
				Dispatchable					Non-Dispatchable
				NQS (Nuclear)	NQS (Other)	Quick-start (Variable Generator)	Quick-start (Hydro)	Quick-start (Other)	Self-scheduling, Transitional and Intermittent
Market Control Entity	New	M	MP	X	X	X	X	X	X
Quick Start Status	Existing (no change)	M	MP	X	X	X	X	X	X
Bid/*Offer* Type	Existing (no change)	M	MP	X	X	X	X	X	X
Primary Fuel Type	Existing (no change)	M	IESO	X	X	X	X	X	X
Alternate Fuel Type	Existing (no change)	O	IESO	X	X	X	X	X	X
Operating Reserve Class	Existing (no change)	M	MP	X	X		X	X	
Elapsed Time to *Dispatch*	Existing (no change)	M	MP	X	X	X	X	X	

Registration Parameter	Existing or New	Mandatory or Optional	Provided/Determined by (MP or *IESO*)	Generation Resource Type					
				Dispatchable					Non-Dispatchable
				NQS (Nuclear)	NQS (Other)	Quick-start (Variable Generator)	Quick-start (Hydro)	Quick-start (Other)	Self-scheduling, Transitional and Intermittent
Generator *Offer* Guarantee Status	New	M	IESO	X	X				
Pseudo Unit Modelling Election	Existing (no change)	O	MP		X				
Generator Turbine Type	Existing (no change)	M	IESO		X				
Steam Turbine Percentage Share	Existing (no change)	M	MP		X				
Steam Turbine Duct Firing Capacity	Existing (no change)	O	IESO		X				
Duct Firing 10-Minute Reserve Capability	New	M	MP		X				
Maximum *Bid*/ *Offer* Ramp Rate	Existing (no change)	M	IESO	X	X	X	X	X	
Maximum Generator Resource Active Power Capability	Existing (no change)	M	IESO	X	X	X	X	X	X

Registration Parameter	Existing or New	Mandatory or Optional	Provided/Determined by (MP or *IESO*)	Generation Resource Type					
				Dispatchable					Non-Dispatchable
				NQS (Nuclear)	NQS (Other)	Quick-start (Variable Generator)	Quick-start (Hydro)	Quick-start (Other)	Self-scheduling, Transitional and Intermittent
Minimum Loading Point	Existing (no change)	M	MP		X				
Minimum Generation Block Run Time	Existing (no change)	M	MP		X				
Period of Steady State Operation	Existing (no change)	M	MP		X				
Number of *Forbidden Regions*	Existing (modification)	O	MP				X		
Start Indication Value	New	O	MP				X		
Hourly Must Run Flag	New	O	MP				X		
Shared Daily *Energy* Limits	New	O	MP				X		
Daily Cascading Hydroelectric Dependency	Retired (See Time Lag)	O	MP				X		
Time Lag	New	O	MP				X		
Energy Market Access Flag	New	M	IESO	X	X	X	X	X	X

Market Control Entity

Market control entity will be a new registration parameter used in the future day-ahead market and *real-time market*. The *IESO* must be aware of other persons that have the ability to control or influence the participation of a *market participant* in the future day-ahead market and *real-time market*.

Existing and new *market participants* registering resources as dispatchable and non-dispatchable *generation facilities* will be required to disclose their market control entities during the Facility Registration process.

Market control entity means, with respect to a *market participant*, any person that meets any of the following criteria:

- beneficially owns, directly or indirectly, voting securities carrying more than 10 per cent of the voting rights attached to all voting securities of the *market participant*; [5]
- directly or indirectly, whether through one or more subsidiaries or otherwise, is able to elect or appoint at least 10 per cent of the directors of the *market participant*, other than ex officio directors;
- is a partner in or of the *market participant*;
- has a substantial beneficial interest in the *market participant* or that serves as a trustee in the *market participant*, if the *market participant* is a trust;
- is an *affiliate* of the *market participant*, excluding *affiliates* of the *market participant* that are controlled by the *market participant*[6]; or
- has any form of agreement with an entity whereby: (i) the *market participant* associated with a resource confers the right or ability to determine the resource's *energy* and *operating reserve offers* and *bids* to that entity or the ability to follow the *dispatch instructions* given to the resource; and (ii) that entity is entitled to receive more than 10 per cent of the amounts paid to the *market participant* in respect of all *energy* and *operating reserve* transacted through the *energy* and *operating reserve* markets.

[5] Similar thresholds are used in the Business Corporations Act (Ontario), Securities Act (Ontario), and the Canada Business Corporations Act.

[6] For example, *market participants* B and C share a parent company A and *market participant* B wholly owns a subsidiary D. Although B is an affiliate of A, C and D, only A and C would be considered market control entities for *market participant* B.

Quick Start Status

The quick start status parameter will continue to be a mandatory registration parameter. It will be used to identify that the registered resource is associated with *generation units* that are capable of injecting *energy* into the *IESO-controlled grid* within five minutes of receiving a *dispatch instruction* from an offline state. The *IESO* will continue to assign a value of Yes for the registered resource only if the *market participant* assigned a value of Yes for all registered *generation units* associated with the registered resource.

The RT calculation engine will continue to use the quick start status to determine whether a resource can receive *dispatch instructions* from an offline state. The *settlement process* will also continue to use the value set for this parameter to determine generator *offer* guarantee (GOG) and make-whole payment eligibility.

Bid/Offer Type

The *bid/offer* type parameter will continue to be a mandatory registration parameter that identifies a registered generation resource as either a dispatchable *generation facility*, a *self-scheduling generation facility* or an *intermittent generator*.

The EMI will continue to use this parameter to identify the *dispatch data* parameters that *registered market participants* will be eligible to submit for their registered resources, based on the *dispatch data* parameters that apply to the registered *bid/offer* type.

The *market participant* will continue to specify the *bid/offer* type for each of their registered resources.

Primary Fuel Type

The primary fuel type parameter will continue to be a mandatory registration parameter that represents the primary fuel used by a resource. The *IESO* will continue to use this parameter for *publishing* and reporting resource information by fuel type.

The *IESO* will continue to determine the primary fuel type based on the primary fuel type that the *market participant* provided for the *generation units* associated with the registered resource.

Alternate Fuel Type

The alternate fuel type parameter will continue to be an optional registration parameter that represents the secondary fuel used by resource. The *IESO* will continue to use this parameter for *publishing* and reporting resource information by fuel type.

The *IESO* will continue to determine the alternate fuel type based on the alternate fuel type that the *market participant* provided for the *generation units* associated with the registered resource.

Operating Reserve Class

The *operating reserve* class parameter will continue to be a mandatory registration parameter that identifies whether the resource is eligible to provide *operating reserve*. This parameter will continue to be available for all registered dispatchable *generation facilities* with the exception of those resources with a registered primary or alternate fuel type of wind or solar photovoltaic. The EMI will continue to use this parameter to indicate which class or classes of *operating reserve* can be submitted for the resource by the *registered market participant.*

The *market participant* will continue to request which of the following classes of *operating reserve* they wish to be eligible to provide for the registered resource:

- synchronized *ten-minute operating reserve*;
- non-synchronized *ten-minute operating reserve*; and
- *thirty-minute operating reserve*.

Elapsed Time to Dispatch

The elapsed time to dispatch parameter will continue to represent the minimum amount of time, in minutes, between the time at which a start-up sequence is initiated for a *generation unit* and the time at which it becomes dispatchable by reaching its *minimum loading point*.

This parameter will continue to be mandatory for resources registered as a dispatchable NQS *generation facility* only.

Elapsed time to dispatch will be used to determine whether a generation resource qualifies for the generator *offer* guarantee status. The *market participant* will continue to be responsible for providing this information.

Generator Offer Guarantee Status

As described earlier, the generator *offer* guarantee (GOG) status will be a new mandatory registration status that will represent whether a resource registered as a dispatchable NQS *generation facility* will be eligible for guarantee payments when the day-ahead market or pre-dispatch calculation engine commits the *facility* in the day-ahead market or pre-dispatch timeframe. With the introduction of the GOG status, the current day-ahead production cost guarantee (DA-PCG) and real-time generator cost guarantee status (RT-GCG) will become obsolete.

The *settlement process* will use the GOG status and other registered parameters for a resource registered as a NQS *generation facility* to determine whether the registered resource requires any guarantee payments after the day-ahead market and the *real-time market* has cleared.

The resource will qualify for GOG status if the *market participant* registers the resource with:

- an *elapsed time to dispatch* greater than sixty minutes;
- a *minimum loading point* greater than zero;
- a *minimum generation block run-time* (MGBRT) greater than one hour; and
- a primary or secondary fuel type that is not uranium.

Pseudo-Unit Modelling Election

Pseudo-unit modelling election is an existing registration parameter that indicates that the *market participant* has requested to submit their *dispatch data* for a *pseudo-unit* resource type instead of a physical *generation unit* resource type in the current DACP.

This parameter will be updated to indicate the *market participant* is electing to submit their *dispatch data* for a *pseudo-unit* resource type in the day-ahead market, pre-dispatch scheduling process and the *real-time market.*

Pseudo-unit modelling election will continue to only be available to *market participants* registering a resource as a NQS combined cycle *generation facility* with primary fuel types of gas or steam if:

- all combustion turbine *generation units* and steam turbine *generation units* are part of the same registered *generation facility* and are under the operational control of a single *market participant*;
- all combustion turbine *generation units* and steam turbine *generation units* have been registered individually;
- the steam turbine *generation unit* is not part of an aggregate with a combustion turbine *generation unit*;
- all combustion turbine *generation units* and steam turbine *generation units* are registered with a *bid/offer* type of dispatchable *generation facility;* and
- all combustion turbine *generation unit*s and steam turbine *generation unit*s are settled under a single metered *market participant*.

In the future market, the request for *pseudo-unit* modelling will also be subject to *IESO* approval based on whether modelling the combined cycle *facility* as *pseudo-unit* resource(s) will affect the *reliability* of the *IESO-controlled grid*.

If a *market participant* elects to model their combined cycle *generation facility* as a *pseudo-unit* resource, all *generation units* at the *facility* must be modeled as *pseudo-units*. The *market participant* will continue to indicate which of their registered combustion and steam turbine *generation unit* resources will be modeled with each *pseudo-unit* resource.

Generator Turbine Type

Generator turbine type will continue to be a mandatory registration parameter for the *IESO* to specify which of the *market participant's* registered resources are combustion turbines or steam turbines where the *market participant* has elected to submit *dispatch data* for a *pseudo-unit* via the *pseudo-unit* modelling election parameter described above.

This field will continue to be determined by the *IESO* based on data submitted by the *market participant* for the *generation unit*.

Steam Turbine Percentage Share

Steam turbine percentage share will continue to be defined as the amount of steam turbine capacity associated with each registered *pseudo-unit*, expressed as a percentage. The number of share percentage values to be submitted will continue to be equal to the number of combustion turbine resources registered for the NQS combined cycle *generating facility*.

This parameter will continue to be mandatory for a *market participant* who has elected to submit *dispatch data* for a *pseudo-unit* via the *pseudo-unit* modelling election parameter described above.

The registered steam turbine percentage share value will be used to calculate the maximum generator resource active power capability (MGRAPC) and steam turbine duct firing capacity of a *pseudo-unit*.

The following validation rules will continue to apply:

- the number of steam turbine percentage share values registered must equal the number of registered combustion turbine generation resources elected for *pseudo-unit* modeling;
- each steam turbine percentage share value must be non-negative and in the format xx.x %;
- the sum of all steam turbine percentage share value must equal 100.0%; and
- each steam turbine percentage share value multiplied by the registered MGRAPC for the steam turbine *generation unit* must be greater than or equal to the *minimum loading point* for one combustion turbine to one steam turbine relationship.

The *market participant* will continue to submit the values for this parameter.

Steam Turbine Duct Firing Capacity

Steam turbine duct firing capacity will continue to be an optional registration parameter that represents the capacity available from the duct firing of a steam turbine *generation unit*. The *IESO* will continue to determine the value of this parameter where the *market participant* has elected to model the steam turbine *generation unit* resource as a *pseudo-unit* for a resource registered as a dispatchable NQS combined cycle *generation facility*.

Steam turbine duct firing capacity is currently used to calculate the duct firing operating region when scheduling *pseudo-units* in the DACP calculation engine. In the future day-ahead and *real-time market,* this parameter will be used by the DAM, PD and RT calculation engines.

The value must continue to be greater than or equal to 0 MW and less than or equal to MGRAPC for the steam turbine *generation unit* less the registered number of combustion turbine *generation units* multiplied by the registered 1-on-1 *minimum loading point* for the stream turbine *generation unit.*

"0=<*Steam Turbine Duct Firing Capacity*+<*Steam Turbine MGRAPC*-

[" ("*Registered Number of Combustion Turbines*")"

*(*Registered Steam Turbine MLP 1-on-1*")]

Duct Firing 10-Minute Reserve Capability

Duct firing 10-minute reserve capability is a new mandatory registration parameter submitted for *market participants* that elect to submit *dispatch data* for *pseudo-units*. Steam turbines may not have the capability to initiate duct firing to respond to a 10-minute reserve activation. This parameter can be used to prevent steam turbines associated with *pseudo-units* from receiving 10-minute reserve schedules within the duct firing operating region.

The DAM, PD and RT calculation engines will use this parameter to determine which classes of *operating reserve* can be scheduled in the duct firing region. When set to ‘No’, a *pseudo-unit* will not be scheduled for 10-minute synchronized or 10-minute non-synchronized *operating reserve* in the duct firing region. A value of ‘Yes’ allows calculation engines to schedule any class of *operating reserve* in the duct firing region.

Maximum Bid/Offer Ramp Rate

The maximum *bid/offer* ramp rate parameter will continue to be a mandatory registration parameter that represents the maximum ramp rate of a generation resource that is registered as a dispatchable *generation facility*.

This parameter will continue to be used by the EMI to validate the submission of *energy* ramp rate and *operating reserve* ramp rate as *dispatch data.* The *IESO* will continue to determine the value for this parameter based on the sum of the values provided by the *market participant* for each registered *generation unit* that is associated with the registered resource. For *pseudo-units,* the value will continue to be based on the sum of values provided by the *market participant* for the associated combustion turbine and steam turbine *generation units.*

Maximum Generator Resource Active Power Capability

The maximum generator resource active power capability parameter will continue to be a mandatory registration parameter that represents the maximum active power capability of a registered resource.

The *IESO* will continue to determine the value for this parameter based on the sum of the values provided by the *market participant* for each *generation unit* associated with the registered resource. For *pseudo-units,* the value will continue to be based on the value provided by the *market participant* for the associated combustion turbine *generation unit* plus the value provided for the steam turbine *generation unit* multiplied by the value provided for the steam turbine share percentage.

This value will continue to be used by the EMI to validate the submission of *offers* for *energy* or *operating reserve* as *dispatch data.*

Minimum Loading Point

Minimum loading point (MLP) will continue to be a registration parameter that represents the minimum amount of *energy*, in MW, that a resource registered as a NQS *generation facility* must maintain to remain stable without the support of ignition. MLP will continue to be mandatory for *market participants* registering a resource as a dispatchable NQS *generation facility* with the exception of those with a registered fuel type of uranium.

Market participants will continue to provide an MLP value for the registered resource. The value must continue to be greater than zero and less than or equal to the maximum generator resource active power capability value registered for the resource.

The MLP value registered for the resource will continue to be used by the EMI to validate the submission of *minimum loading point* as *dispatch data* by the *registered market participant*. Refer to the Offers, Bids and Data Inputs detailed design document for the validation rules.

A steam turbine *generation unit* that is registered with a combined cycle *generation or cogeneration facility* will continue to be able to submit each of its n-on-1 MLPs where applicable. The number of n-on-1 MLPs that can be submitted for a steam

turbine *generation unit* will continue to be dependent on the number of combustion turbine *generation unit*s registered with the combined-cycle *generation facility*.

The *IESO* will review and approve the MLP provided for the registered resource based on the MLP values provided by the *market participant* for the *generation units* associated with the registered resource, and any supporting technical documentation provided by the *market participant*.

Minimum Generation Block Run Time

Minimum generation block run time (MGBRT) will continue to be a registration parameter that represents the minimum number of consecutive hours an NQS *generation facility* must be scheduled to its *minimum loading point*. It will continue to be a mandatory parameter for a resource that is registered as a dispatchable NQS *generation facility* with the exception of those with a registered fuel type of uranium.

The registered value for MGBRT will be used to determine eligibility for the GOG status as described in the GOG section above.

The MGBRT registration parameter will not be used by EMI for validation of submission of *dispatch data*. Instead, a MGBRT reference level will be determined by the *IESO* and used by the EMI to mitigate the submission of MGBRT as *dispatch data.* Refer to Section 3.7 for more information about reference level registration requirements. Refer to the Offers, Bids and Data Inputs detailed design document for more information about mitigation rules for MGBRT values submitted as *dispatch data.*

MGBRT will continue to be registered by the *market participant* and approved by the *IESO* based on supporting technical documentation provided by the *market participant*. The registered quantity must continue to be a value between 0 and 24 hours.

Period of Steady Operation

Period of steady operation will continue to be a mandatory registration parameter that represents the number of five-minute *dispatch interval*s for which an NQS *generation facility* must maintain steady operation before changing direction of its *energy* output (either increasing or decreasing). This parameter will only be mandatory for a resource registered as a NQS *generation facility*.

Period of steady operation will continue to be used by the RT calculation engine to maintain the direction of the registered resource's *dispatch instruction* for the minimum number of intervals registered by the *market participant*.

The *market participant* will continue to provide the values for this parameter, which must continue to be equal to 0, 1 or 2 five-minute intervals.

Number of Forbidden Regions

The number of *forbidden regions* will continue to be a registration parameter that represents the predefined operating ranges within which a hydroelectric *generation facility* cannot maintain steady operation without causing equipment damage. This parameter will continue to be only optional for *market participants* to specify when registering a dispatchable hydroelectric *generation facility.*

Market participants will continue to have multiple *forbidden regions* available that they can register for the resource with an upper and lower limit specified in MW for each *forbidden region*. The maximum number of *forbidden regions* available to register will be defined in the *market manuals*. If registered, *forbidden regions* must continue to meet the following criteria:

- The lower limit for the first *forbidden region* shall be greater than or equal to 0;
- The upper limit for the first *forbidden region* shall be greater than the lower limit for the first *forbidden region*;
- The lower limits for all subsequent *forbidden regions* shall be greater than the upper limits for all previous *forbidden regions;* and
- The upper limits for all subsequent *forbidden regions* shall be greater than its corresponding lower limit.

The *IESO* will continue to review the registered data and may request additional technical data to support the values registered. The *IESO* may deny registration of the *forbidden regions* if the *IESO* determines that the technical data does not support the request.

If the *market participant* does not register any values, the *IESO* will continue to assign default values of zero.

Currently, only the real-time calculation engine uses *forbidden regions* to ensure that the resource registered as a dispatchable hydroelectric *generation facility* does not receive *dispatch instructions* within the registered *forbidden regions*. In the future day-ahead market and *real-time market*, the DAM, PD and RT calculation engines will respect the *forbidden regions* that are submitted as *dispatch data*.

The registered *forbidden regions* will be used for validation of *dispatch data* submissions as described in the Offers, Bids and Data Inputs detailed design document. If no values are registered for *forbidden regions*, the *registered market participant* will not be permitted to submit *forbidden regions* as *dispatch data*.

Start Indication Value

The start indication value will be a new optional registration parameter that represents the minimum quantity of *energy* a resource must be scheduled to

determine whether the *generation units* associated with resource have used up one or more of their maximum number of starts per day.

Market participants must provide one or more MW values for each resource that is registered as a dispatchable hydroelectric *generation facility*. The number of MW values available will be equal to the number of *generation units* associated with the resource. The values provided must be greater than 0 MW and less than or equal to the maximum active power capability registered for each resource. If no value is provided, the *registered market participant* will not be permitted to submit maximum number of starts per day as *dispatch data.*

The value for this parameter will be used by the DAM and PD calculation engines to ensure the maximum number of starts per day for the resource submitted as *dispatch data* by the *registered market participant* are not exceeded.

Hourly Must Run Flag

The hourly must run flag will be a new optional registration parameter that indicates a registered resource is eligible to have *dispatch data* submitted for hourly must run conditions. Only resources registered as a dispatchable hydroelectric *generation facility* will be eligible to register this parameter.

Market participants will be required to prove they have hourly must run conditions by providing technical data or other applicable supporting documentation to support the flag be registered for each identified resource.

The *IESO* will review the registered data and may request additional technical data to support the flag registration. The *IESO* may deny registration of the hourly must run flag if the *IESO* determines that the technical data does not support the request.

The registered flag for this parameter will be used to validate hourly must run values can be submitted as dispatch *data* into the DAM and PD calculation engines. Resources that do not have a registered hourly must run flag set to yes will not be permitted to submit hourly must run values as *dispatch data*.

Shared Daily Energy Limits

Shared daily *energy* limits will be a new registration parameter that will indicate whether one or more resources registered by the same *market participant* draw water from the same forebay. This parameter will be optional for resources registered as dispatchable hydroelectric *generation facilities*.

The DAM and PD calculation engines will use the shared daily *energy* limits parameter to ensure all resources registered to share this parameter are evaluated such that the sum of their hourly schedules respect the shared daily *energy* limit

(DEL) and minimum daily *energy* (MDE) parameters submitted as *dispatch data* by the *registered market participant.*

The *market participant* will indicate which resources share the same forebay and the *IESO* will review and approve the request after validating that the resources in fact draw water from the same forebay. If no indication is provided, the DAM and PD calculation engines will continue to evaluate DEL and MDE *dispatch data* on an individual resource basis.

Time Lag

Time lag will be a new optional registration parameter that replaces the existing *daily cascading hydroelectric dependency* (DCHD) flag. Like DCHD today, time lag will be used to identify a dispatchable hydroelectric *generation facility* has a minimum hydraulic time lag of less than 24 hours to or from an adjacent cascading hydroelectric *facility* controlled by the same *registered market participant.* Time lag will also will be used to:

- register the maximum amount of amount of time it takes for the water discharge from an upstream *generation facility* to reach a downstream *generation facility* that is on the same cascade river system and controlled by the same *registered market participant;* and
- make the *registered market participant* eligible to submit linked resource, time lag and MWh ratios as *dispatch data* into the day-ahead market and *pre-dispatch* scheduling process.

The registered value for this parameter will be used to validate the time lag submitted as *dispatch data* into the DAM and PD calculation engines. Resources that do not have registered time lag values will not be permitted to submit linked resources, time lag and MWh ratio as *dispatch data*.

The time lag value must be a whole number that is greater than or equal to 0 hours and less than 24 hours. The *IESO* will review the registered data and may request additional technical data to support registration of time lag. The *IESO* may deny registration of time lag if the *IESO* determines that the technical data does not support the request.

Energy Market Access Flag

The *energy* market access flag will be a new registration parameter that replaces the real-time *energy* market flag used in the current Facility Registration process. It will be a mandatory registration parameter that indicates that *dispatch data* can be submitted for the registered generation resource into the future day-ahead market and *real-time market* via the *market participant* EMI.

3.6.2. Load Resource Parameters

Table 3-6 summarizes the resource registration parameters that apply to the various types of load resources that can participate in the future day-ahead market and *real-time market.* These parameters are used by the *IESO* tools and processes to support *dispatch data* validation, scheduling and *dispatch* decisions and *settlement* in the future day-ahead market and *real-time market*.

These parameters are determined after the *IESO*-determined resource identifiers and *market participant*-resource relationships are established as described in Section 3.4.1. 'MP' denotes that the equipment registration specialist assigned by the *market participant* is responsible for providing the registered data and '*IESO*' denotes that the *IESO* determines the registration data based on other equipment information provided by the equipment registration specialist. Descriptions for each parameter follow the table.

Table 3-6: Load Resource Registration Parameters

Registration Parameter	Existing or New	Mandatory or Optional	Registered By	Load Resource Type			
				Non-Dispatchable Load	Dispatchable Load	Price Responsive Load	Hourly Demand Response
Market Control Entity	New	M	MP		X	x	
Bid/*Offer* Type	Existing (modified)	M	MP	x	X	x	x
Operating Reserve Class	Existing (no change)	M	MP		X		
Maximum *Bid*/*Offer* Ramp Rate	Existing (no change)	M	IESO		X		
Maximum Registered Dispatchable/ Price Responsive Load	Existing (modified)	M	IESO		X	x	
Minimum Registered Dispatchable	Existing (no	O	IESO		X		x

Registration Parameter	Existing or New	Mandatory or Optional	Registered By	Load Resource Type			
				Non-Dispatchable Load	Dispatchable Load	Price Responsive Load	Hourly Demand Response
Load	change)						
Energy Market Access Flag	Existing (modified)	M	IESO		X	x	x

Market Control Entity

As described in Section 3.6.1 for generation resources, the *IESO* must be aware of other persons that have the ability to control or influence the participation of a *market participant* in the future day-ahead market and *real-time market*. This is referred to as a market control entity.

The same criteria described in Section 3.6.1 for generation resources will be used to determine market control entities for existing and new *market participants* registering resources as *dispatchable load,* price responsive load and physical and virtual *hourly demand response* resources.

Bid/Offer Type

The *bid/offer* type parameter is currently a mandatory registration parameter that identifies a resource registered as a *load facility* as either a *dispatchable load* or a *non-dispatchable load*. It will continue to be a mandatory registration parameter and will be updated for a resource to be identified as a price responsive load. The *market participant* will continue to specify the *bid/offer* type for each of their registered resources.

The EMI will continue to use this parameter to identify to *registered market participants* the *dispatch data* parameters they will be eligible to submit for their registered resources, based on the *dispatch data* parameters that apply to the registered *bid/offer* type.

Market participants will be able to change their *bid/offer* type from a *dispatchable load* or a price responsive load to a *non-dispatchable load* and vice versa. For more details on the requirements specific to submitting these change requests, refer to Section 3.8.2 in this document.

Operating Reserve Class

The *operating reserve* class parameter will continue to be a mandatory registration parameter that identifies the resource is eligible to provide *operating reserve*. This

parameter will continue to only be available for resources registered as a *dispatchable load*. The *market participant* will continue to request which of the following classes of *operating reserve* they wish the registered resource to be eligible to provide:

- synchronized *ten-minute operating reserve*;
- non-synchronized *ten-minute operating reserve*; and
- *thirty-minute operating reserve*.

The EMI will continue to use this parameter to indicate which class or classes of *operating reserve* can be submitted for the resource by the *registered market participant.*

Maximum Bid/Offer Ramp Rate

The maximum *bid/offer* ramp rate parameter will continue to be a mandatory registration parameter that represents the maximum ramp rate of a resource that is registered as a *dispatchable load*. The *IESO* will continue to determine the value for this parameter based on the sum of the values provided by the *market participant* for each registered load equipment associated with the registered resource.

This parameter will continue to be used by the EMI to validate the submission of *energy* ramp rate and *operating reserve* ramp rate as *dispatch data.*

Maximum Registered Dispatchable or Price Responsive Load

The maximum registered dispatchable or price responsive load parameter will replace the existing maximum registered *dispatchable load* parameter to represent the maximum active power capability of a load resource registered as a *dispatchable load* or a price responsive load. The parameter will continue to be mandatory for the *IESO* to determine the value for this parameter based on the sum of the values provided by the *market participant* for all registered load equipment associated with the registered resource*.*

This value will continue to be used to calculate the maximum *offers* for *energy* or *operating reserve* that can be submitted as *dispatch data* for a resource registered as a *dispatchable load*. For a resource registered as price responsive load, this value will be used to calculate only the maximum *offers* for *energy* that can be submitted as *dispatch data* and only in the day-ahead market. These values will therefore be used by the EMI to validate the *dispatch data* submitted for the registered resource by the *registered market participant*.

Minimum Registered Dispatchable Load

The minimum registered *dispatchable load* parameter will continue to be an optional registration parameter that represents the *minimum loading point* for a

resource that is registered as a *dispatchable load*. The *IESO* will continue to determine the value for this parameter based on the sum of the values provided by the *market participant* for each registered load equipment associated with the registered resource.

Energy Market Access Flag

The *energy* market access flag will be a new registration parameter that replaces the real-time *energy* market flag used in the current Facility Registration process. It will be a mandatory registration parameter that indicates that *dispatch data* can be submitted for the registered resource into the future day-ahead market and *real-time market* via the *market participant* EMI for a *dispatchable load* as well as a physical and virtual *hourly demand response* resource.

For a price responsive load, this flag will indicate that *dispatch data* can be submitted for registered resources into the future day-ahead market only.

3.7. Reference Levels and Reference Quantities for Market Power Mitigation

Reference levels and reference quantities will be a new set of mandatory registration requirements that the *IESO* will determine and use to respectively support the Ex-Ante and Ex-post Market Power Mitigation processes in the future market.

Ex-ante validation of non-financial *dispatch data* parameters will take place at the time of *dispatch data* submission. Ex-ante mitigation of financial *dispatch data* parameters will take place within the DAM and PD calculation engines. The *IESO* will reject the non-financial *dispatch data* upon submission when any *dispatch data* parameter violates the registered reference level for such parameters. The IESO will mitigate the financial *dispatch data* parameters to the registered reference level when such submitted parameters fail the market power conduct and impact tests. Ex-post mitigation will take place after market clearing and *settlement* of a *dispatch day* to assess potential instances of physical withholding using the registered reference quantities.

Reference levels will be determined for all financial *offer* parameters and some non-financial *offer* parameters that *registered market participants* submit as *dispatch data*. Reference quantities will be determined for resources participating in the *energy* or the *operating reserve markets*. Reference quantities are estimates of quantities that a resource is expected to *offer* in the *energy* and the *operating reserve* markets for a *dispatch day*.

A *registered market participant* will not be authorized to submit any *dispatch data* into future day-ahead market or the *real-time market* until the *IESO* determines the

complete set of reference levels and reference quantities applicable for the *market participant's* resource.

Market participants will have the opportunity to request an independent review of their reference levels and reference quantities during the registration process. Refer to the Market Power Mitigation detailed design document for more information on how the reference levels for financial and non-financial *dispatch data* parameters, and how the reference quantities will be determined, reviewed and used to support the Market Power Mitigation processes in the ex-ante and the ex-post timeframes.

3.7.1. Reference Levels for Financial *Offer* Parameters

Table 3-7 describes the financial *offer* parameters for which the *IESO* will determine a registered reference level and which resources the reference levels will be determined for.

Table 3-7: Reference Levels for Financial Offer Parameters

Registered Reference Level Name	Target Financial Offer Parameter	Target Financial Offer Parameter Description	Reference Level Registered For
Energy offer reference level	*Energy offer*	The range of incremental *price-quantity pairs* submitted for *energy* that can differ from hour to hour.	All dispatchable *generation facilities*
Start-up *offer* reference level	Start-up *offer*	The dollar amount required to bring an offline resource through all the *generation unit*-specific startup procedures to *minimum loading point*.	All dispatchable NQS *generation facilities* that register their intent to submit start-up offers (see Section 3.5.1).
Speed no-load *offer* reference level	Speed no-load *offer*	This is the hourly dollar amount required to operate a *generation unit* in a synchronized status while injecting no *energy* to the *IESO-controlled grid*.	All dispatchable NQS *generation facilities* that register their intent to submit speed no-load offers (see Section 3.5.1).
Operating reserve offer reference level (one for each class)	*Operating reserve offer*	The range of incremental *price-quantity pairs* for *operating reserve* that can differ for every *dispatch hour.* Separate sets of *price-quantities pairs* apply for each class of *operating reserve*.	• All dispatchable generation facilities • All dispatchable loads

3.7.2. Reference Levels for Non-Financial *Offer* Parameters

Summer and winter reference level values will be determined by the *IESO* for all non-financial *offer* parameters. For the purposes of market power mitigation:

- Summer refers to the period from May 1 to October 31; and
- Winter refers to the period from November 1 to April 30.

The *IESO* will determine reference level values for a resource based on an assessment of how the resource is reasonably capable of operating in a competitive environment rather than under operational limits.

Table 3-8 describes the non-financial *offer* parameters for which the *IESO* will determine a registered reference level and which resources the reference levels will be determined for.

Table 3-8: Reference Levels for Non-Financial Offer Parameters

Registered Reference Level Name	Target Non-Financial Offer Parameter	Target Non-Financial Offer Parameter Description	Reference Level Registered For
Energy ramp rate reference level	*Energy* ramp rate	The rate, in megawatts per minute (MW/min), at which a resource can increase or decrease its output.	All dispatchable *generation facilities*
Operating reserve ramp rate reference level	*Operating reserve* ramp rate	The rate, in MW/min that a resource can respond to an *operating reserve* activation.	• All dispatchable *generation facilities* • All *dispatchable loads*
Lead time reference level (hot, warm and cold)	Lead time (hot, warm and cold)	The amount of time, in hours, needed for a *generation unit* to start-up and reach its MLP from an offline state. The length of the lead time will depend on the thermal operating state of the *generation unit* as either hot, warm or cold.	All dispatchable NQS combined cycle *generation facilities*
Minimum loading point reference level	*Minimum loading point*	The minimum MW output that a *generation unit* must maintain to remain stable without the support of ignition.	All dispatchable NQS combined cycle *generation facilities*
Minimum generation block run time reference level	Minimum generation block run time	Represents the minimum number of consecutive hours a *generation unit* must be scheduled to its MLP.	All dispatchable NQS combined cycle *generation facilities*

Registered Reference Level Name	Target Non-Financial Offer Parameter	Target Non-Financial Offer Parameter Description	Reference Level Registered For
Minimum generation block down time reference level (hot, warm and cold)	Minimum generation block down time (hot, warm and cold)	The minimum number of hours between the time when a *generation unit* was last at its MLP before de-synchronization and the time the *generation unit* can be scheduled back to its MLP after re-synchronizing. The length will depend on the thermal operating state of the *generation unit* as either hot, warm or cold.	All dispatchable NQS combined cycle *generation facilities*
Maximum number of starts per day reference level	Maximum number of starts per day	The maximum number of times a resource associated with one or more *generation units* is physically able to be started within a *dispatch day.*	• All dispatchable NQS *generation facilities* (excluding nuclear) • All dispatchable hydroelectric *generation facilities*
Ramp hours to MLP reference level	Ramp hours to MLP	The minimum number of hours required for the resource to ramp from synchronization to its MLP. Different values can apply for each thermal state of hot, warm and cold.	All dispatchable NQS combined cycle *generation facilities*
Energy per ramp hour reference level[7]	*Energy* per ramp hour	The average quantity of *energy* in MWh that the resource is expected to produce in each ramp hour to MLP for each thermal state of hot, warm and cold.	All dispatchable NQS combined cycle *generation facilities*

[7] A reference level for an upper and lower bound will be registered for each thermal state.

3.8. Facility Maintenance

Facility maintenance captures changes to a *market participant's registered facility* information. *Market participants* will continue to be required to update their *facility* information for changes made to the physical configurations, technical capabilities, data monitoring and voice communications, *market participant*/resource relationships and resource parameters for their *registered facilities.* Depending on the change request submitted by the *market participant*, the *market participant* may continue to require a Registration Approval Notification (RAN) document to be issued before allowing the change to be made.

3.8.1. Technical Changes

Market participants will continue to be required to apply to the *IESO* to alter the registered physical capabilities of their *facility*. These changes may include changes to the maximum or minimum quantities injected into or withdrawn from the *IESO-controlled grid*, data monitoring or voice communications and exemptions to outage management reporting requirements. The *IESO* will continue to assess whether changes adversely impact the *reliability* of the *IESO-controlled grid*.

3.8.2. Market Participation Changes

Market Participant Class Changes

Market participants will continue to request changes to their class of participation in the *IESO-administered markets* through the Authorization and Participation process. The *IESO* will continue to verify whether a change in a *market participant's* class of participation requires a corresponding change to their *facility* registration information.

Resource Registration Parameter Changes

Market participants will continue to be required to request changes to how their registered resource is used in the *IESO-administered markets*. These changes may include changes to the resource's *bid*/*offer* type, the *operating reserve* it can provide, its *minimum loading point*, etc.

New *facility* maintenance requirements will apply for *market participants* that request a change to the *bid/offer* type for load resources.

A *market participant* that requests a change to its *bid/offer* type from a *non-dispatchable load* to a *dispatchable load* must continue to do so at least six months prior to the effective date. The *market participant* must complete all registration and connection requirements as a *dispatchable load*, at least five *business days* prior to the effective date.

A *market participant* that requests a change to its *bid/offer* type from a *non-dispatchable load* to a price response load must do so at least one month prior to the effective date. The *market participant* must ensure that they have completed all registration and connection requirements as a price responsive load, at least five *business day*s prior to the effective date.

A *market participant* that requests a change to its *bid/offer* type from a *dispatchable load* or price responsive load to a *non-dispatchable load* must do so at least seven *business day*s prior to the effective date.

Once the *bid/ offer* type change to *non-dispatchable load* takes effect, the *market participant* will not be permitted to change their *bid/offer* type back to a *dispatchable load* or price responsive load for a minimum period of twelve months.

3.8.3. Transfer of Registration of Facilities

A *market participant* who wishes to transfer the registration of a *facility* to another *market participant* as a result of their intent to sell, lease, assign, or transfer control of that *facility* must continue to submit a request to the *IESO* for the transfer of the *facility* at least 10 *business days* in advance of the proposed date of transfer.

3.9. Facility De-registration

Market participants who wish to de-register a *facility* or *facilities* that are being decommissioned will continue to be required to file a notice of request to de-register with the *IESO*. The existing *facility* de-registration process will not change in the future day-ahead market and *real-time market.*

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

Updates to this inventory since the publication of the Facility Registration 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-00451: Facility Registration on the Market Renewal Implementation Engagement page to review any further changes between this inventory and the draft *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 design document. Resulting *market rule* amendments will incorporate the integration of the individual design documents.

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

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

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

Table 4-1: Market Rule Chapter 2 Impacts

Market Rule Section	Type	Topic	Requirement
Appendix 2.2 S1.1	Existing - no change	Voice Communications	Section 1.1: • This section specifies the technical requirements for *market participant*s for voice communication, monitoring and control, and workstations. • Provisions unaffected by the design changes specified in the Facility Registration design document.

Table 4-2: Market Rule Chapter 4 Impacts

Market Rule Section	Type	Topic	Requirement
Appendix 4.1 to Appendix 4.23	Existing - no change	Grid Connection Requirements	Appendix 4.1 to 4.23: • These sections specify technical requirements for various *facility* types. • Provisions unaffected by the design changes specified in the Facility Registration design document.

Table 4-3: Market Rule Chapter 7 Impacts

Market Rule Section	Type	Topic	Requirement
Section 2	Existing - requires modification	Title – Registration for Physical Operations	The title 'Registration for Physical Operations' is not inclusive of a day-ahead market: • *Amendments* are required to make the section applicable to *real-time market* physical operations and day-ahead market physical transactions. • Change title to “Registration for Physical Operations in the Day-Ahead and *Real-Time Markets*.” Consequential *amendments* to create new defined terms in Chapter 11 of the *market rules* are required to define physical transactions and

Market Rule Section	Type	Topic	Requirement
			virtual transactions.
Section 2.1.1	Existing - requires modification	Requirements for Operating on the Grid	Section 2.1.1: • This section sets forth the *market rules* obligations for registering *facilities* in the *real-time market*, as a prerequisite for participating in the *real-time markets*. • This section needs to be expanded to include obligations with respect to the day-ahead market for physical transactions – "No person shall participate in the *real-time markets*, submit *offers* or *bids* for physical transactions in the day-ahead market."
Section 2.1.1	Existing - no change	Requirements for Operating on the Grid	Sections 2.1.1.1 to 2.1.1.3: • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.1.1/ Section 2.1.1.4 NEW SUB-SECTION	New	Requirements for Operating on the Grid – Market Power Mitigation	Section 2.1.1 - New sub-section 2.1.1.4: • Add new sub-section 2.1.1.4 under Section 2.1.1: • New obligation which specifies that a person must provide all information as specified in the future market power mitigation provisions in the *market rules*, in order for the *IESO* to establish reference levels and reference quantities. This new obligation will be one of the conditions which must be met by persons wishing to participate in the *real-time markets*, or persons submitting *offers* or *bids* for physical transactions in the day-ahead market. • New section which specifies that *market participants* may request independent review of their reference levels and reference quantities during the *facility* registration process. OVERLAP: MARKET POWER MITIGATION

Market Rule Section	Type	Topic	Requirement
Section 2.1.1A	Existing - no change	Exceptions to Requirements for Operating on the Grid	Section 2.1.1A: • This section specifies that Section 2.1.1.3 (which specifies obligations where *registered facilities* that are *generation facilities* connected to a neighboring *control area*, and the electricity or *physical service* is conveyed over a *radial intertie*) shall not apply for the delivery of electricity or a *physical service* out of the *integrated power system* over a *radial intertie* where such delivery is required to provide support in the case of an *emergency* or *outage* in a *control area*, or a *contingency event*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.1.2	Existing - no change	Submission of Dispatch Data	Section 2.1.2: • This section specifies that a *market participant* shall not submit, and the *IESO* shall not accept, any *dispatch data* with respect to a *facility* or *boundary entity* unless: o That *facility* or *boundary entity* is a *registered facility*; o That *market participant* is the *registered market participant* for that *registered facility*; and o The *dispatch data* is consistent with registration information, the *market participant's* reasonable expectations of the current actual capabilities of the *registered facility,* and any revision in registration info requested by the *IESO* under Section 7.5.6.3 or provision of the *market rules*. • Provisions unaffected by the design changes specified in the Facility Registration design document.

Market Rule Section	Type	Topic	Requirement
Section 2.1.3	Existing - no change	Exceptions from Obligations to Register	Section 2.1.3: • This section specifies exceptions for registering a *facility* for *facilities* embedded within a *distribution system*, or *load facilities* or *generation facilities* less than 1MW. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2	Existing - no change	Registered Facilities	Sections 2.2.1, 2.2.2, 2.2.3, 2.2.4: • These sections specify registration requirements for *market participants* applying to register a *facility* or *boundary entity* (including but not limited to registering a *registered market participant*, required information, applicable technical requirements, required certifications, completion of testing. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2	New	Rejection of values or requests	Section 2.2.3C: • New section to allow the *IESO* to reject a *pseudo-unit* modelling election request that may have an impact to the *reliability* of the *IESO-control grid* or material impact to the operation of the *IESO-administered markets.*
Section 2.2	Existing - no change	Registered Facilities	Section 2.2.5: • This section specifies that the *IESO* shall define the form and content of information required for registration as a *registered facility* in accordance with Sections 2.2.6 to 2.2.8. • Provisions unaffected by the design changes specified in the Facility Registration design document. Section 2.2.6: • This section specifies the general information requirements for all *facility* types (including but not limited to the identity of the owner,

Market Rule Section	Type	Topic	Requirement
			identity of the *market participant* authorized to submit *dispatch data*), in addition to requirements for specific *facility* sub-types (*cogeneration facilities*). • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.6A	Existing - requires amendment	Registered Facilities – Hydroelectric Generation Facilities	Section 2.2.6A: • This section gives a *generation facility* the ability to submit *forbidden regions* and *period of steady operation.* If submitted, the *market participant* is obligated to respect such information when submitting *dispatch data* for the *real-time market*. • Amend to specify that *market participants* will have the ability to submit *forbidden regions* as *dispatch data* in the day-ahead market, as well as the *real-time market*. • Amend to delete the obligation for *market participants* to respect registered *forbidden regions* when submitting *dispatch data*, since the *forbidden regions* submitted by the *registered market participant* will be automatically respected by all calculation engines. • Amend to obligate/allow a *generation facility* to provide the following new registration values: o Optional: a start indication value in MW; o Optional: the intention to submit hourly must run *dispatch data* o Optional: shared daily *energy* limit parameters; OVERLAP: OFFERS, BIDS and DATA INPUTS and DAM, PRE-DISPATCH and REAL-TIME CALCULATION ENGINES
Section 2.2.6B	Existing - no change	Registered Facilities – Dispatchable	Section 2.2.6B: • This section specifies that a *registered market participant* for a dispatchable *generation*

Market Rule Section	Type	Topic	Requirement
		Generation Facilities	*facility* must submit to the *IESO* the *minimum loading point* (MLP), the *minimum generation block run-time* (MGBRT), and the *minimum run-time* for the *generation facility* if the MLP for the *facility* is greater than zero MW and if the MGBRT for the *facility* is greater than one hour. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.6D	Existing - no change	Registered Facilities – Dispatchable Generation Facilities - Start Up Time, Minimum Shut Time Down	Section 2.2.6D: • This section specifies that the *IESO* may request that the *registered market participant* for a dispatchable *generation facility* submit to the *IESO* the *start-up time* and *minimum shut-down* time for a *generation facility*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.6E	Existing - no change	Registered Facilities – Generation Facility's Minimum Loading Point, Forbidden Regions, Period of Steady Operation	Section 2.2.6E: • This section specifies that if no *facility* specific data is submitted to the *IESO* for a *generation facility's minimum loading point*, *forbidden regions*, or *period of steady operation* in accordance with Sections 2.2.6A and 2.2.6B, the *IESO* shall assign default values of zero for that data. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.6F	Existing requires modification	Registered Facilities – Facility Specific Data Used for Day Ahead and Real-Time	Section 2.2.6F: • This section specifies that if *facility* specific data is submitted to the *IESO* in accordance with Sections 2.2.6A, 2.2.6B, 2.2.6G or 2.2.6J, the *IESO* shall respect the data as submitted in its determination of the *real-time schedule* in accordance with Section 6, and the day-ahead schedule in accordance with Section 5. • Amend to specify that the *IESO* shall respect

Market Rule Section	Type	Topic	Requirement
			the data as submitted in its determination of day-ahead, pre-*dispatch*, and real-time schedules/calculations as applicable. Details and *market rule* cross references to be determined. OVERLAP: Day-Ahead Market Calculation Engine, Pre-Dispatch Calculation Engine, and Real-Time Calculation Engine design documents.
Section 2.2.6G	Existing – requires modification	Registered Facilities – Combined Cycle Facilities	Section 2.2.6G: • This section specifies that in accordance with the applicable *market manual*, a *registered market participant* that operates a combined cycle *facility* that is not aggregated under Section 2.3, shall submit to the *IESO* the require data for that combined cycle *facility*, and for those *registered market participants* that wish to designate their non-aggregated combined cycle *facility* as a *pseudo-unit* in the day-ahead commitment process set out in Section 5.8, the required data for that *pseudo-unit*. • Amend to specify that *registered market participants* that wish to designate their non-aggregated combined cycle *facility* as a *pseudo-unit*, must submit the required data in the day-ahead market, pre-*dispatch* scheduling and *real-time market.* Details and *market rule* cross references to be determined. OVERLAP: Day-Ahead Market Calculation Engine, Pre-Dispatch Calculation Engine, and Real-Time Calculation Engine design documents.
Section 2.2.6H	Existing - requires amendment	Registered Facilities – Dispatchable Hydroelectric Generation Facilities –Time Lag	Section 2.2.6H: • This section obligates a *registered market participant* for a *dispatchable* hydroelectric *generation facility* to submit to the *IESO* where applicable, the *daily cascading hydroelectric dependency* for that *generation facility*.

Market Rule Section	Type	Topic	Requirement
			• *Amendments* are required to specify *market participant* obligations to provide supporting documentation to support time lag, and to specify *IESO* authority to deny, at its sole discretion should the technical data not support such status.
Section 2.2.6I	Existing - no change	Registered Facilities – IESO Determination of Pseudo-Unit Parameters Based on Market Participant Data	Section 2.2.6I: • This section obligates the *IESO* to determine, in accordance with the applicable *market manual*, the *pseudo-unit* technical parameters based on the *facility* specific data submitted under Section 2.2.6J. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.6J	Existing – requires modification	Registered Facilities - Dispatchable Generation Facilities and Pseudo-Units – Daily Generator Data	Section 2.2.6J: • Daily Generator Data: This section specifies that a *registered market participant* for a dispatchable *generation facility* that is not a *quick-start facility*, may submit on a daily basis the *minimum loading point*, the *minimum generation block run-time*, the maximum number of starts per day and the minimum generation block down time, and for facilities designated as a *pseudo-unit* under Section 2.2.6G, the combustion turbine single cycle mode, and the *IESO* shall use this data in the day-ahead commitment process set out in Section 5.8. • Relocate section to Section 3 of Chapter 7 and expand as required for new daily *dispatch data* parameters for hydroelectric *generation facilities* and *generation facilities* that are not *quick start generation facilities*. *Dispatch data* requirements to be specified in the Offers, Bids and Data Inputs detailed design document. OVERLAP: OFFERS, BIDS and DATA INPUTS

Market Rule Section	Type	Topic	Requirement
Section 2.2.6K	Existing - no change	Registered Facilities – Dispatchable Generation Facilities and Elapsed Time to Dispatch	Section 2.2.6K: • This section obligates a *registered market participant* for a *dispatchable generation facility* to submit to the *IESO* the elapsed time to *dispatch* for the *generation facility*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.7	Existing - no change	Registered Facilities – Boundary Entities	Section 2.2.7: • This section specifies registration requirements for *boundary entities*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.8	Existing - no change	Registered Facilities – Registration Information – Operating Reserve	Section 2.2.8: • This section specifies the registration information required for a *facility* or *boundary entity* that will provide *operating reserves*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.9 to 2.2.12	Existing - no change	Registered Facilities – Self-Scheduling Generation Facilities	Sections 2.2.9 to 2.2.12: • These sections specify the registration requirements for *self-scheduling generation facilities*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.13 to 2.2.16	Existing - no change	Registered Facilities – Intermittent Generators	Sections 2.2.13 to 2.2.16: • These sections specify the registration requirements for *intermittent generators*. • Provisions unaffected by the design changes specified in the Facility Registration design document.

Market Rule Section	Type	Topic	Requirement
Section 2.2.17 to 2.2.18	Existing - no change	Registered Facilities – Distribution Systems	Sections 2.2.13 to 2.2.16: • These sections specify the registration requirements for *distribution systems*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2.19 to 2.2.23	Existing - no change	Registered Facilities – Transitional Scheduling Generators	Sections 2.2.13 to 2.2.16: • These sections specify the registration requirements for *transitional scheduling generators*. • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.2 (Sub-section 2.2.25)	New	Registered Facilities – Registration for Load Facilities for Day-Ahead Market Physical Transactions	Section 2.2 – Sub-section 2.2.25: • New section may be required to specify any additional registration requirements for *load facilities* for day-ahead market physical transactions, including details on price responsive loads.
Section 2.2A	Existing - no change	Registration of Commissioning Generation Facilities	Section 2.2A: • This section specifies the registration requirements for commissioning *generation facilities* in the *real-time markets* as *self-scheduling generation facilities*. • Provisions unaffected by the design changes specified in the Facility Registration chapter – commissioning generation facilities will continue to participate only in the *real-time markets*.
Section 2.2B	Existing - requires modification	Generation Facility Eligibility for the Real-Time Generation Cost Guarantee	Section 2.2B: • This section specifies the eligibility requirements for the real-time generation cost guarantee for non-*quick start facilities*. • Delete – to be replaced by the Generator *Offer* Guarantee. Corresponding *market rules* to be codified in Chapter 9 of the *market rules*.

Market Rule Section	Type	Topic	Requirement
			OVERLAP: MARKET SETTLEMENT
Section 2.2C	Existing - requires amendment	Generation Facility Eligibility for the Day-Ahead Production Cost Guarantee	Section 2.2C: • This section specifies the eligibility requirements for the day-ahead production cost guarantee for non-*quick start facilities*. • Delete – to be replaced by the Generator *Offer* Guarantee. Corresponding *market rules* to be codified in Chapter 9 of the *market rules*. OVERLAP: MARKET SETTLEMENT
Section 2.3	Existing - requires modification	Aggregated Registered Facilities	Section 2.3: • This section specifies the *market participant* application process to the *IESO* to aggregate *facilities* for the purpose of delivering or withdrawing one or more *physical services* in the *real-time energy market*, the *procurement markets* or both. The section also specifies the *IESO* approval process of such applications for aggregation. • Sections 2.3.1, 2.3.1.1, 2.3.1.2: *Amendments* are required to make clear that the aggregation and treatment of *facilities* as a single *facility* would apply uniformly to *physical transactions* in the day-ahead market and the *real-time market* (Section 2.3.1) and that the aggregation for a *facility* must be the same for both markets.
Section 2.4	Existing - no change	De-Registration of Facilities	Section 2.4: • This section specifies the de-registration of a *registered facility* (other than a *boundary entity*). • Provisions unaffected by the design changes specified in the Facility Registration design document.
Section 2.5	Existing - no change	Transfer of Registration of Facilities	Section 2.5: • This section specifies the transfer a *registered facility* (other than a *boundary entity*), as a

Market Rule Section	Type	Topic	Requirement
			result of the sale, assignment, lease, transfer of control or other means of disposition. • Provisions unaffected by the design changes specified in the Facility Registration design document.

– End of Section –

5. Procedural Requirements

5.1. Market-Facing Procedural Impacts

The existing *market manuals* related to the Facility Registration process will be retained to the extent possible. The majority of changes result from the introduction of a day-ahead market and *real-time market* with locational marginal pricing, virtual transaction *energy* traders, price responsive loads and new *dispatch data* parameters within the future day-ahead market and *real-time market*. The document most directly related to the Facility Registration process is:

Market Manuals:

- Market Manual 1: Connecting to Ontario's Power System, Part 1.5 – Market Registration Procedures.

Table 5-1 identifies new sections related to the Facility Registration process that will be created, existing sections within the *market manual* that will require modification, and existing sections that will still have relevance in the future market.

Impacts to Market Manual 1: Connecting to Ontario's Power System, Part 1.5 – Market Registration Procedures related to the Authorization and Participation process are listed in Table 5-1 of the Authorization and Participation process detailed design chapter.

Table 5-1: Impacts to 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	Existing - requires modification	3 Register Equipment	This section will require updates to include reference to the day-ahead market in addition to the *real-time market*.
	New	Section 3, Sub-section TBD	New sub-section to describe the Facility Registration process for virtual transactions zonal trading entities above or below the existing sub-section describing Facility Registration process for boundary entities.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing - requires modification	3 Register Equipment	This section will require updates to include reference to the day-ahead market in addition to the *real-time market*.
	Existing - no change	3.1 Register Equipment Overview	This section can be retained as is.
	Existing - no change	3.1.1 Prerequisite Requirements	This section can be retained as is.
	Existing - no change	3.1.2 Equipment Registration Specialist	This section can be retained as is.
	Existing - no change	3.1.3 Market Participant/ Equipment Role Relationship	This section can be retained as is.
	Existing - requires modification	3.1.4 Physical Facility/Resource Relationship	May be updated to include the relationship between physical *facilities* and resources registered as price responsive load in the day-ahead market.
	Existing - requires modification	3.1.5 Market Participant/ Resource Role Relationships	This section will be updated to include relationships between resources and market control entities.
	Existing - no change	3.2 Registering Facility, Equipment, and Resource Data	This section can be retained as is. The procedural overview of the Facility Registration process for physical facilities in the future market will remain the same as the current *real-time market*. Future markets will require changes to registration input data. Registration input data details are not discussed within this section.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing - no change	3.2.1 Metering Requirements	This section can be retained as is. Metering requirements in this section will continue to be applicable for existing and new facilities in the future market.
	Existing - no change	3.2.2 Data Monitoring Requirements	This section can be retained as is. Data monitoring requirements will not change in the future market.
	Existing - no change	3.2.3 Market Rule Exemptions	This section can be retained as is. *Market rule exemptions* will not change in the future market.
	Existing - requires modification	3.2.4 Facility Registration Status	This section will require updates to include reference to the day-ahead market in addition to the *real-time market* / *physical market*.
	Existing - no change	3.3 Market Participant and Facility Testing	This section and its sub-sections can be retained as is.
	Existing – requires modification	3.4 Day-Ahead Commitment Process – Registration Requirements	Replace DACP references with day-ahead market or day-ahead market and *real-time market* as applicable. Table 3.3 to be updated to identify CCP and PSU registration applicable to DAM, PD and RT calculation engines. Resource types in this table to be updated to include price responsive load. Table.3.4 title to be updated to include price responsive loads and additional generation and load resource registration parameters per resource type described in Section 3 of this document.
	Existing – requires modification	3.4.1 Minimum Loading Point	• Replace references to DA-PCG with GOG eligibility. • Include requirement for *IESO* to establish a reference level value for *minimum loading point*.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing – requires modification	3.4.2 Minimum Generation Block Run Time	• Replace references to DA-PCG with GOG eligibility. • Include requirement for *IESO* to establish a reference level value for *minimum generation block run time*.
	Existing – requires modification	3.4.3 Elapsed Time to Dispatch	Replace references to DA-PCG with GOG eligibility.
	Existing – requires modification	3.4.4 Day-Ahead Production Cost Guarantee	Section to be removed for future markets and updated to GOG eligibility.
	Existing – requires modification	3.4.5 Daily Cascading Hydroelectric Dependency	Remove references to eligible *energy* limited resource (EELR) as the DACP re-submission window will not be used in the future day-ahead market. Update section to indicate that time lag will be used to determine whether a *registered market participant* will be eligible to submit cascade hydroelectric dependency constraints as *dispatch data*.
	Existing - no change	3.4.6 Quick Start Flag	Existing quick-start flag requirements will continue to apply for the future day-ahead market and *real-time market.*
	Existing - no change	3.4.7 Generator Primary and Secondary Fuel Type	Existing primary and secondary fuel-type parameter requirements will continue to apply for the future day-ahead market and *real-time market.*
	Existing – requires modification	3.4.8 Three-Part Offer Eligibility Declaration	Update to indicate that three-part *offer* eligibility declaration applies to *dispatch data* submission into the DAM and PD calculation engines.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing – requires modification	3.5 Day-Ahead Commitment Process – Combined Cycle Plants Registration Requirements	• Update sub-sections to clarify that *pseudo-unit* modelling registration data applies to DAM, PD and RT calculation engines. • Clarification required that *pseudo-unit* modelling will be made available in all timeframes.
	Existing – requires modification	3.6 Operating Reserve – Dispatchable Load	Requirements to be updated to reflect rules for changing the *bid/offer* type status for a load resource registered from *non-dispatchable load* to either price responsive load and/or *dispatchable load*.
	Existing - no change	3.7 Aggregation	This section can be retained as is.
	Existing – requires modification	3.8 Real-Time Generation Cost Guarantee	Section to be removed for future markets and updated to GOG eligibility.
	Existing - no change	3.9 Variable Generation	This section and its sub-sections can be retained as is. Future markets will utilize existing registration requirements for variable generation facilities and their associated meteorological measurement facilities.
	Existing - no change	3.10 Additional Generation Facility Characteristics	This section and its sub-sections can be retained as is.
	Existing - no change	3.11 Next Steps	This section and its sub-sections can be retained as is.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing - requires modification	4.2 Facility and Equipment Data Maintenance	• Update “resource attribute changes” • *Facility* maintenance requirements to be updated to reflect rules for changing the *bid/offer* type status for a load resource registered from *non-dispatchable load* to either price responsive load and/or *dispatchable load*. • *Facility* maintenance process to include virtual transaction zonal trading entities in addition to existing physical facilities and boundary entities. • *Facility* maintenance requirements stemming from resource attribute to include additional hydroelectric resource parameters that will be utilized in the day-ahead market and pre-*dispatch* timeframe. • Reference to existing RT-GCG eligibility to be updated to GOG eligibility.
	Existing - no change	4.2.1 Data Monitoring and Voice Communications Changes	This section can be retained as is.
	Existing - no change	4.2.2 Assessments for Operating Reserve Market Participation	This section can be retained as is.
	Existing - no change	4.2.3 Changes to Self-Scheduling Generators	This section can be retained as is.
	Existing - no change	4.2.4 Changes to Intermittent Generators	This section can be retained as is.

Procedure	Type of Change (no change, modification, new)	Section	Description
Part 1.5: Market Registration Procedures	Existing - no change	4.2.5 Changes to Cogeneration Facilities	This section can be retained as is.
	Existing - requires modification	4.2.6 Transfer of Facility Registration	*Facility* transfer to be updated to include transfer restrictions in future markets for price responsive load.
	Existing - no change	4.3 Changes in Documents	This section can be retained as is. Changes in operational control sufficient to function in the future market.
	Existing - no change	5.1 Facility De-registration	This section can be retained as is. Deregistration requirements will not change in the future market.
	Existing - no change	5.3.2 Deregistration for Non-Compliance	This section can be retained as is. Deregistration requirements will not change in the future market.
	Existing - no change	Appendix B Technical Requirements	This section can be retained as is. Technical requirements will not change in the future market.
	Existing - no change	Appendix C Wind Facility Data Requirements	This section can be retained as is. Wind *facility* data requirements will not change in the future market.
	Existing - no change	Appendix D Solar Facility Data Requirements	This section can be retained as is. Solar *facility* requirements will not change in the future market.
	New	Appendix, TBD	A new training guide may be required that addresses *facility* registration requirements for the day-ahead market.

5.2. Internal Procedural Impacts

Most of the internal procedures currently used by the Facility Registration process will continue to have relevance in the future markets. However, many of the existing procedures will be clarified to differentiate the registration of *facilities* for the *real-time market* and the day-ahead market.

Some changes to the Facility Registration process under the market renewal program will impact other internal *IESO* processes. For the most part, the changes to the Facility Registration process under the market renewal program do not impact the internal manuals related to these other internal processes. 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 Facility Registration process between physical transactions/*real-time market* activity and virtual transactions. 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, and are not included in the published detailed design. Appendix B details the impacts to internal procedures in terms of existing procedures that support the new market requirements, existing procedures that need to be updated, and new internal procedures that need to be created to support the new market.

– End of Section –

6. Business Process and Information Flow Overview

6.1. Market-Facing Process Impacts

This section provides an overview to the arrangement of processes required in order to support the overall Facility Registration 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 Facility Registration process. This section now presents the Facility Registration 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 a flowchart); and
- logical architecture and systems architecture (as might be illustrated in a logical application and data design, and/or physical application and data design).

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

- the Facility Registration 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 Facility Registration process;
- external destinations of key information from the Facility Registration process; and
- the same logical boundary of the Facility Registration 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 Facility Registration 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 Facility Registration process for the future day-ahead market and *real-time market.*

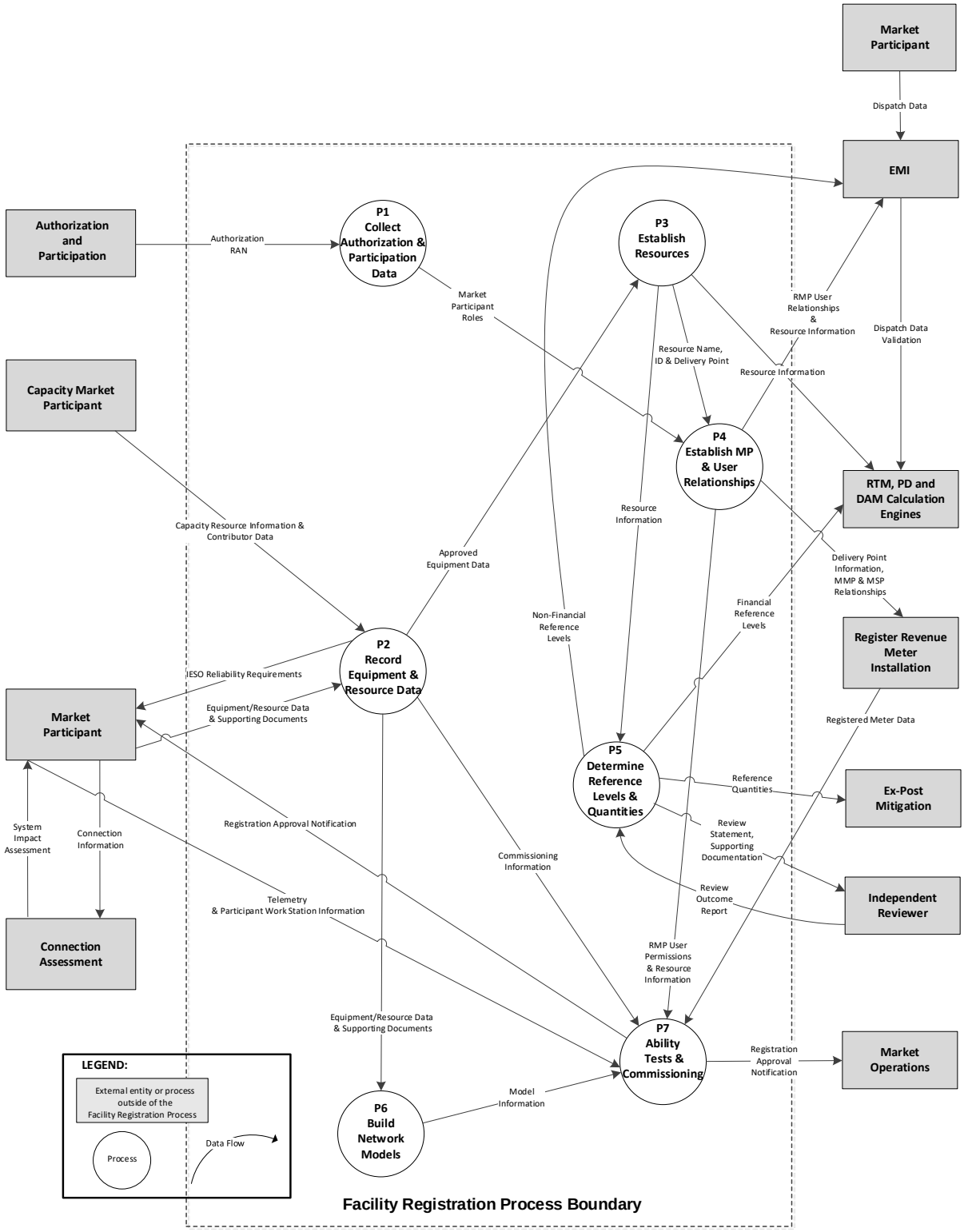

Figure 6-1: Facility Registration Data Flow Diagram – Level 1

6.1.1. Process P1 – Collect Authorization and Participation Data

Description

Process P1 transfers information to the Facility Registration process from *market participants, demand response market participants* and the Authorization and Participation process. This process allows the Facility Registration process to begin.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Authorization Registration Approval Notification (RAN)	Authorization and Participation Process	Process P1	Once – changes triggered by new submissions.
Description: The authorization RAN confirms that: • *Market participants* are authorized to participate as *generation facilities* and *load facilities* in the day-ahead market and *real-time market*; • *Market participants* registering price responsive load *facilities* are authorized to participate in the day-ahead market; • *Intertie* traders are authorized to engage in import and export activities in the day-ahead market and *real-time market;* • Virtual transaction *energy* traders are authorized to submit virtual transactions in the day-ahead market; and • *Demand* response *market participant*s are authorized to fulfill their *demand* response capacity obligations in the day-ahead market and *real-time market*.			
Flow	**Source**	**Target**	**Frequency**
Market participant roles	Process P1	Process P4	Once – changes triggered by new submissions.
Description: • The *market participants* authorized as owners, metered *market participants*, metering service providers, *registered market participants* and operators are made available to P4 process for the establishment of *market participant* to resource relationships. • The *market participants* authorized as transmitters are made available to P4 process for the establishment of *market participant* to transmission network and transmission connection resource relationships.			

6.1.2. Process P2 – Record Equipment and Resource Data

Description

The *market participant* designated as the *facility* owner assigns an equipment registration specialist who records the *facility* equipment and corresponding technical information.

Once the *IESO* assigns resource names and resources IDs to the *facility* equipment under process P3, the equipment registration specialist also records additional information for each assigned resource.

The *IESO* also uses the information that a *market participant* has submitted to develop a list of *reliability* requirements for the equipment registered by the *market participant.* The *reliability* requirements include:

- *outage* reporting requirements;
- operational telemetering requirements;
- performance validation testing requirements, where applicable; and
- commissioning requirements, where applicable.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Equipment/ Resource Data and Supporting Documents	Market participant	Process P2	Once – changes triggered by new submissions
Description: • The equipment registration specialist submits *facility* equipment information via Online IESO. This data will be either mandatory or optional, and may require supporting documentation to verify the data. The equipment registration specialist also assigns *facility* contacts such as the 24/7 contact responsible for operating equipment at the *facility* location. • A single line diagram (SLD) is required for all *facilities* being registered for participation in the *physical markets*. The SLD shows the electrical equipment at the *facility* and connection to the *IESO-controlled grid*. The SLD must also have enough detail to assist the *IESO* in determining requirements for data monitoring.			
Flow	**Source**	**Target**	**Frequency**

Demand Response Resource Information and Contributor Data	Demand response market participant	Process P2	Once – changes triggered by new submissions

Description:

- The *demand* response *market participant* submits resource and *demand* response contributor information via Online IESO.

Flow	Source	Target	Frequency
IESO Reliability Requirements	Process P2	Market Participant	Once – changes triggered by new submissions

Description:

This is the *IESO* determined list of:

- Required operational telemetry to assist the *market participant* in the set up of data monitoring. Used for installation of a new RTU or changes in the technical characteristics of existing RTUs;
- Equipment that requires *outage* reporting; and
- Equipment requiring performance validation testing and commissioning during the P7 process.

Flow	Source	Target	Frequency
Equipment/ Resource Data and Supporting Documents	Process P2	Process P6	Once – changes triggered by new submissions

Description:

- The supporting documents, equipment and resource information recorded by the *market participant* and the *IESO* are made available to the P6 process so that the *IESO* can build and test various network models to reflect the resources needed for market activity, real-time monitoring requirements and *settlement* requirements.
- This data is assessed to ensure that information is complete and within normal ranges, and that no material change has occurred in the *facility* compared to the data presented in any system study.

Flow	Source	Target	Frequency
Commissioning Information	Process P2	Process P7	Once – changes triggered by new submissions

Description: • If the *IESO* identifies to the owner that commissioning is required based on the equipment submitted in process P2, commissioning activities will be included in the P7 process.			
Flow	**Source**	**Target**	**Frequency**
Approved Equipment Data	Process P2	Process P3	Once – changes triggered by new submissions
Description: • The equipment data submitted by the equipment registration specialist is made available to the P3 process for the *IESO* to determine the resource name and resource IDs for equipment that require an equipment-resource relationship.			

6.1.3. Process P3 – Establish Resources

Description

Once the *IESO* approves the equipment information submitted by the equipment registration specialist, the *IESO* determines resource names, resource IDs and *delivery points* for the resources that will be used for participation in the *IESO-administered market.* This establishes resource-equipment relationships used by various *IESO* systems. The build network models process also uses this information to facilitate update of the network model.

Input and Output Data Flows

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

Flow	**Source**	**Target**	**Frequency**
Approved Equipment Data	Process P2	Process P3	Once – changes triggered by new submissions
Description: • The equipment data submitted by the equipment registration specialist is made available to the P3 process for the *IESO* to determine the resource name and resource IDs for equipment that require an equipment-resource relationship.			
Flow	**Source**	**Target**	**Frequency**

Resource Name & ID	Process P3	Process P4	Once – changes triggered by new submissions

Description:

- The resource name and ID are provided to the P3 process so that the equipment registration specialist can assign the appropriate *market participant* roles to the resource.

Flow	Source	Target	Frequency
Delivery Point	P3 Process	P4 Process	Once – changes triggered by new submissions

Description:

- The *delivery point* for the resource is provided to the P3 process so that the equipment registration specialist can assign the *metered market participant* as identified by the *market participant* to the *delivery point* for the resource. This will allow *metered market participant* to assign a *metering service provider* to the metering installation associated with the *delivery point.*

Flow	Source	Target	Frequency
Resource Information	P3 Process	RTM, PD & DAM Calculation Engines	Once – changes triggered by new submissions

Description:

- Resource registration parameter values are made available to the calculation engines for scheduling processes.

6.1.4. Process P4 – Establish Market Participant and User Relationships

Description

The *market participant* designated as the *facility* owner assigns the *metered market participant*, *registered market participant* and operator relationships to the resources of the *facility.*

The *metered market participant* assigns any *metering service provider* (MSP) relationships to the *delivery point* for the resource. The *metered market participant* can continue to be different from the *registered market participant* associated with the resource.

The *registered market participant* assigns the users that will submit *dispatch data* for the resources established by the *IESO* during the P3 process. The RMP is the only authorized entity able to submit *dispatch data* with respect to that *facility* and is bound to fulfill the requirements laid out in Chapter 7 of the *market rules*.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Market participant roles	Process P1	Process P4	Once – changes triggered by new submissions
Description: • The *market participants* authorized as owners, *metered market participants, metering service providers* and operators are made available to P4 process for the establishment of *market participant* to resource relationships. • The *market participant* owner assigns the *metered market participant* responsible for *settlement* with the *IESO* of all quantities of *physical service*s related to the *delivery point* for the resource. • The *market participant* owner assigns the *registered market participant* authorized to submit *dispatch data* for the assigned resource. • The *market participants* authorized as *transmitters* are made available to P4 process for the establishment of *market participant* to transmission network and transmission connections resource relationships.			
Flow	**Source**	**Target**	**Frequency**
Resource Name & ID	Process P3	Process P4	Once – changes triggered by new submissions
Description: • The resource name and ID are provided to the P3 process so that the equipment registration specialist can assign the appropriate *market participant* roles to the resource.			
Flow	**Source**	**Target**	**Frequency**
Delivery Point	Process P3	Process P4	Once – changes triggered by new submissions

Description:

- The *delivery point* for the resource is provided to the P3 process so that the equipment registration specialist can assign the *metered market participant* as identified by the *market participant* to the *delivery point* for the resource. This will allow *metered market participant* to assign a *metering service provider* to the metering installation associated with the *delivery point.*

Flow	Source	Target	Frequency
Delivery Point Info and MMP/MSP Relationships	P4 Process	Register Revenue Meter Installation process	Once – changes triggered by new submissions

Description:

- The *metered market participant* assigns *metering service provider* (MSP) relationships to the *delivery point* for the resource. This allows the Register Revenue Meter Installation process to begin.

Flow	Source	Target	Frequency
RMP-User Relationships and Resource Information	Process P4	EMI	Once – changes triggered by new submissions

Description:

- The *registered market participant* provides end-user access to the EMI by creating the RMP-User Relationships.
- Resource registration parameter values are made available to the EMI for *dispatch data* validation processes.

Flow	Source	Target	Frequency
RMP-User Permissions and Resource Information	Process P4	Process P7	Once – changes triggered by new submissions

Description:

- The RMP-user permissions and resource information is made available to the Ability Testing and Commissioning process to confirm a *registered market participant* can communicate with the *IESO* via their participant workstation and if applicable, their *dispatch workstation*.

6.1.5. Process P5 – Determine Reference Levels and Reference Quantities

Description

Reference levels and reference quantities are mandatory registration requirements that the *IESO* will determine and respectively use to support the Ex-Ante and Ex-Post Market Power Mitigation processes in the future market.

Ex-ante mitigation will take place either during *dispatch data* validation or within the DAM, PD and RT calculation engines. When any parameter of a *market participant's dispatch data* fails the conduct and impact tests for market power, the *IESO* will mitigate that *dispatch data* parameter to the registered reference level.

Ex-post mitigation will take place after the *dispatch day* to assess potential instances of physical withholding using the registered reference quantities.

Reference levels will be determined for all financial *dispatch data* parameters and some non-financial *dispatch data* parameters that *registered market participants* may submit for a resource. Reference quantities will be determined for all resources participating in the *energy* or *operating reserve markets*. A *registered market participant* will not be authorized to submit any *dispatch data* into future day-ahead market or *real-time market* until the *IESO* determines the complete set of reference levels and reference quantities applicable for the *market participant's* resource. *Market participants* will have the opportunity to request an independent review of their reference levels and reference quantities during the registration process.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Resource Information	Process P3	Process P5	Changes triggered by new submissions
Description: • The financial and non-financial *dispatch data* parameters for which the *IESO* will determine a registered reference level for applicable resource parameters are made available to the P5 process. • The *IESO* works with *market participants* to establish the reference level registration values required for their registered resources.			
Flow	**Source**	**Target**	**Frequency**

Financial Reference Levels	Process P5	DAM and PD Calculation Engines	As necessary

Description:

- The financial reference levels are made available to the DAM and PD calculation engines for ex-ante market power mitigation.

Flow	Source	Target	Frequency
Reference Quantities	Process P5	Ex-Post Mitigation	As necessary

Description:

- The reference quantities are made available to the ex-post market power mitigation process, to assess potential instances of physical withholding.

Flow	Source	Target	Frequency
Review Statement, Supporting Documentation	Process P5	Independent Reviewer	Event-based, market participant requested independent review

Description:

- The *market participant* may request an independent third party review of certain aspects of the materials submitted in support of a *market participant's* proposed reference levels or reference quantities.
- The *IESO* will provide the independent reviewer and the *market participant* with a statement of the matters to be reviewed, submitted materials relevant to these matters and any relevant communications between the *market participant* and the *IESO*.

Flow	Source	Target	Frequency
Review Outcome Report	Independent Reviewer	Process P5	Event-based, after the independent reviewer completes their review

Description:

- The independent reviewer will review the materials provided and then provide a confidential written report to the *market participant* and the *IESO* setting out its findings and the reasons supporting the findings.

Flow	Source	Target	Frequency

Non-Financial Reference Levels	Process P5	EMI	As necessary
Description: • The non-financial reference levels are made available to EMI for validation of non-financial *dispatch data*.			

6.1.6. Process P6 – Build Network Models

Description

The *IESO* is responsible for maintaining a network model that reflects the topology and operating characteristics of the various *transmission*, *distribution*, *generation* and *load facilities* that make up the *IESO-controlled grid*. The network model also includes a simplified representation of power systems in neighboring jurisdictions.

The network model is maintained and updated every four to six weeks through the Network Model Build process. This process is typically used to incorporate new *facility* registrations or update existing *facility* registrations. During each Network Model Build cycle, the *IESO* develops and tests changes to the network model in a test environment before deploying the model into the production environment.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Equipment/Resource Data and Supporting Documents	Process P2	Process P6	Once – changes triggered by new submissions
Description: • The supporting documents, equipment and resource information recorded by the *market participant* and the *IESO* are made available to the P6 process so that the *IESO* can build and test various network models to reflect the resources needed for market activity, real-time monitoring requirements and *settlement* requirements. • This data is assessed to ensure that information is complete and within normal ranges, and that no material change has occurred in the *facility* compared to the data presented in any system study.			
Flow	**Source**	**Target**	**Frequency**

Model Information	Process P6	Process P7	Once – changes triggered by new submissions

Description:

- Network model information is made available to the P7 process so that the *market participant* and *IESO* can adequately perform the *facility*-related tasks required for its expected market participation.

6.1.7. Process P7 – Ability Tests and Commissioning

Description

Ability tests are conducted to ensure that the *market participant* and the *facility* can inter-operate with the *IESO* over the internet. Ability testing will:

- verify real-time data;
- ensure connectivity of the *dispatch workstation*;
- confirm that appropriate voice communications are in place;
- verify that the *market participant* can actually carry out specific market operations;
- confirm capability of transmitting and the accuracy of the monitored quantities to the *IESO* interface; and
- if applicable, verify that the *facility* responds to the *IESO* control signals.

Equipment commissioning may also be required if the *IESO* determines during the P2 process that owners must demonstrate applicable equipment performance, based on requirements identified in a related *connection assessment,* or the previous registration stage. Commissioning applies to new equipment or modified equipment causing a change to its performance characteristics.

Input and Output Data Flows

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

Flow	Source	Target	Frequency
Registered Meter Data	Register Revenue Meter Installation process	Process P7	Once – changes triggered by new submissions

Description:

- The Register Revenue Meter Installation process confirms that the *market participant* has met metering requirements.

Flow	Source	Target	Frequency
Telemetry and Participant Workstation Information	Market Participant	Process P7	Once – changes triggered by new submissions

Description:

- Data communications and telemetry information data is collected from the *market participant*.
- *Market participant* installs their participant workstation and/or *dispatch* workstation in accordance with the applicable technical requirements in the participant technical reference manual.
- *IESO* IT&I will coordinate the installation of any required communication links and testing.

Flow	Source	Target	Frequency
RMP User permissions and Resource Information	Process P4	Process P7	Once – changes triggered by new submissions

Description:

- The RMP-user permissions and resource information is made available to the Ability Testing and Commissioning process to confirm a *registered market participant* can communicate with the *IESO* via their participant workstation and if applicable, their *dispatch workstation*.

Flow	Source	Target	Frequency
Model Information	Process P6	Process P7	Once – changes triggered by new submissions

Description:

- Network model information is made available to the P7 process so that the *market participant* and *IESO* can adequately perform the *facility*-related tasks required for its expected market participation.

Flow	Source	Target	Frequency

Commissioning Information	Process P2	Process P7	Once – changes triggered by new submissions

Description:

- If the *IESO* identifies to the owner that commissioning is required based on the equipment submitted in process P2, commissioning activities will be included in the P7 process.

Flow	Source	Target	Frequency
Registration Approval Notification (RAN)	Process P7	Market Participant	Once – changes triggered by new submissions

Description:

- *IESO* provides the *market participant* with a final Registration Approval Notification (RAN) once all ability tests and, if applicable commissioning requirements are successfully completed.

Flow	Source	Target	Frequency
Registration Approval Notification (RAN)	Process P7	Market Operations	Once – changes triggered by new submissions

Description:

- Market Registration Services provides Market Operations department a final Registration Approval Notification (RAN) that all ability tests and, if applicable commissioning requirements for the *market participant* are successfully completed.

6.2. Internal Process Impacts

The internal processes used for Facility Registration will continue to have relevance in the future *real-time market* and day-ahead market.

Internal *IESO* processes related to Facility Registration include:

- Record Equipment;
- Prepare for Operations;
- Assess Connection;
- Commission Equipment;
- Maintain Information Entities; and

- Audit Facility.

Some of the internal processes are related to various IESO processes that interact with the Facility Registration process. Some changes to the Facility Registration process under the market renewal program will impact the internal procedures that address these related areas. This may be contingent upon the tools impact of the future day-ahead market and *real-time market*.

Changes or additions to internal *IESO* processes are for internal *IESO* use 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 to *IESO* technical interfaces with *market participant*s that may be required to support the *Facility* Registration process 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	Web client	• New workflow needed to allow the *IESO* to grant virtual transaction *energy* traders access to the nine virtual transaction zonal trading entities. • New workflow needed to allow *market participants* to record market control entities for resources that have a *registered market participant*. • New workflow needed to allow *market participants* registering a price responsive load to assign a *registered market participant* and values for the applicable resource parameters described in Section 3.6.4 of this document. • Generation *Offer* Guarantee will need to be added as a new resource parameter in the workflow for dispatchable NQS generation facilities. • *Pseudo-unit* modelling election parameter will need to be updated to indicate it will permit *pseudo-unit* modelling in the day-ahead market, pre-dispatch scheduling and *real-time market*. Existing DA-PCG and RT-GCG flags to be removed from the workflow. • New resource parameters - Shared Daily *Energy* Limit, Start Indication Value, Hourly Must Run - need to be added as a new resource parameter in the workflow for dispatchable hydroelectric generation facilities. Existing Eligible *Energy* Limited Resource flag to be removed from the workflow. • Logic may need to be added to the workflow for load resources to track the effective dates for *bid*/*offer* type changes from price responsive load and *dispatchable load* to *non-dispatchable load* and vice versa. • Workflows for generation and load resources will have to be

MP Interface Name	Interface Type	Description of Impact
		updated to capture reference levels for the non-financial *offer* parameters listed in Section 3.7.2 of this document.

– 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: Revenue Meter Registration	DES-20
MRP Detailed Design: Offers, Bids and Data Inputs	DES-21
MRP Detailed Design: Grid and Market Operations	DES-22
MRP Detailed Design: Market Power Mitigation	DES-26
MRP Detailed Design: Market Settlement	DES-28
Market Manual 1: Connecting to Ontario's Power System, Part 1.5: Market Registration Procedures	PRO-408
Market Manual 6: Participant Technical Reference Manual	IESO_MAN_0024
Market Manual 12.0 – Demand Response Auction	MAN-44
Market Rules for the Ontario Electricity Market (Market Rules)	MDP_RUL_0002
MDL-19 Enrol Customer-Enterprise Process Group Map	
PRCS-17 Record Equipment – Process Specification	
PRCS-18 Prepare for Operations – Process Specification	
PRCS-33 Commission Equipment – Process Specification	

– End of Document –