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MANUAL

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Market Manual 1: Connecting to Ontario's Power System

Part 1.5: Market Registration Procedures

Issue 1.3
March 9, 2021

This *market manual* is provided for stakeholder engagement purposes. Please note that additional changes to this document may be incorporated as part of future engagement in MRP or other *IESO* activities prior to this *market manual* taking effect.

This procedure describes the activities to be undertaken by the *IESO* and *market participants* to complete the market registration procedures required to participate in the *day-ahead market* and the *real-time market*.

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Document Change History

Issue	Reason for Issue	Date
1.0	Initial release in advance of Baseline 44.0, resulting in the obsoleting of the following market manuals: Market Manual 1.1: Participant Authorization, Maintenance & Exit, Market Manual 1.2: Facility Registration, Maintenance & De-registration, and Market Manual 9.1: Submitting Registration Data for the DACP	June 29, 2020
1.1	Draft published for stakeholder comment as part of MRP Implementation	October 13, 2020
1.2	Updated for stakeholder engagement To reflect: Market Renewal Project	December 4, 2020
1.3	Updated for stakeholder engagement To reflect: Market Renewal Project	March 9, 2021

Related Documents

Document ID	Document Title
MDP_PRO_0048	Market Manual 1.4: Connection Assessment and Approval
IESO_REQ_0208	Market Manual 1.6: Performance Validation

Table of Contents

List of Tables

List of Figures

Table of Changes

Reference	Description of Change
Throughout	"Batch 1" changes for the Market Renewal Program. This version incorporates minor conforming changes reflecting design elements in the following detailed design documents: • Authorization and Participation • Prudential Security • Facility Registration

Market Manuals

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

"Connecting to Ontario's Power System" is Series 1 of the *Market Manuals*, in which this document is "Part 1.5: Market Registration Procedures*".*

Conventions

The standard conventions followed for market manuals are as follows:

- The word 'shall' denotes a mandatory requirement;
- Terms and acronyms used in this market manual including all Parts thereto that are italicized have the meanings ascribed thereto in Chapter 11 of the "Market Rules";
- All user interface labels and options that appear on the IESO portals and tools are formatted with the bold font style;
- Double quotation marks are used to indicate titles of legislation, publications, forms and other documents; and
- Any procedure-specific convention(s) shall be identified within the procedure document itself.

– End of Section –

1.   Introduction

1.1.   Purpose

Market Manual 1: Connecting to Ontario's Power System Part 1.5: Market Registration Procedures is the second of three market manuals that cover the Connecting to Ontario's Power System process. The Connecting to Ontario's Power System process consists of six stages, which are described in the market manuals listed in Table 1.1.

Table 1-1: Market Manuals Related to the Connecting to Ontario's Power System Process

Stage	Market Manual
Prepare application Obtain conditional approval to connect	Market Manual 1: Connecting to Ontario's Power System Part 1.4: Connection Assessment and Approval (formerly Market Manual 2.10)
Design and build	N/A[1]
Authorize market and program participation (also called Participant Authorization) Register equipment	Market Manual 1: Connecting to Ontario's Power System Part 1.5: Market Registration Procedures
Commission equipment and validate performance	Market Manual 1: Connecting to Ontario's Power System Part 1.5: Market Registration Procedures, and Market Manual 1: Connecting to Ontario's Power System Part 1.6: Performance Validation (formerly Market Manual 2.20)

This *market manual* contains the procedures related to Market Registration, which encompasses all of Stages 4 and 5 of the process, in addition to Commission Equipment procedures for Stage 6.

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[1] The "Stage 3: Design and build" activities are determined between the *connection applicant* and its associated *transmitter* or *distributor* after the completion of Stages 1 and 2.

The content of this *market manual* serves as a roadmap for *market participants*, program participants[2] (collectively referred to as "Participants") and service providers[3] and reflects the requirements set out in the *market rules* and in certain standards and policies established by the *IESO*.

As applicable, the procedures in this *market manual* must be followed by:

- any person wishing to apply for participation in the *IESO-administered markets* or programs, or wishing to apply as a service provider (Stage 4);
- any Participant wishing to register equipment (Stage 5);
- any Participant wishing to commission equipment (Stage 6);
- any Participant wishing to update their equipment data;
- any Participant or service provider wishing to update their registration data;
- any Participant wishing to deregister equipment; and
- any Participant or service provider wishing to withdraw their participation from one or more of the *IESO-administered markets* or programs.

The Market Registration Process Schedule provides estimated timelines for the completion of Stages 4 and 5 when a *facility* other than a *boundary entity* or *virtual transaction* zonal trading entity is involved. Listed timelines are for guideline purposes only.

Before starting the procedures described in this *market manual*, it is assumed that prospective Participants[4] or prospective service providers[5] have completed the following applicable prerequisite requirements:

- for prospective *market participants*, those described in section 2.2.1 of this manual;
- for prospective program participants, those described in section 2.3.1 of this *market manual*; and
- for prospective service providers, those described in section 2.4.1 of this *market manual*.

Owners of new *facilities* connecting to the *IESO-controlled grid,* providing an *ancillary service* for the *IESO*, or modifying an existing *facility* registered with the *IESO* are required to complete Stages 1 through 3 of the Connecting to Ontario's Power System process before

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[2] In this *market manual*, a program participant refers to a person that is authorized by the *IESO* to participate in one or more of the programs listed in section 2.3.2 of this *market manual*. A person authorized as a program participant may also be authorized as a *market participant* or service provider.

[3] In this *market manual*, a service provider refers to a person that is authorized by the *IESO* to provide one or more of the services listed in section 2.4.2 of this *market manual*. A person authorized as a service provider may also be authorized as a *market participant* or program participant.

[4] In this *market manual*, a prospective Participant refers to any person applying to be authorized by the *IESO* as a Participant but has not yet been authorized.

[5] In this *market manual*, a prospective service provider refers to any person applying to be authorized by the *IESO* as a service provider but has not yet been authorized.

starting the Market Registration procedures described in this *market manual*. Stages 1 and 2 are described in [Market Manual 1: Connecting to Ontario's Power System Part 1.4: Connection Assessment and Approval](#) procedure.

1.2.   Scope

This *market manual* covers the Market Registration procedures, which are comprised of[6]:

- authorize market and program participation (described in [section 2](#));
- register and commission equipment (described in [section 3)](#);
- maintain Participant, *facility*, and equipment data registered with the *IESO* (described in [section 4](#));
- deregister *facility* (described in [section 5](#)); and
- withdraw participation (described in [section 5](#)).
- In some cases, an *IESO* contract will require an organization to register as a program participant regardless as to whether it has a *facility* that is *connected* to the *IESO-controlled grid*. *Meter* registration must be completed for any *facility* connecting to the *IESO-controlled grid* or where any financial transaction associated with such a *facility* is to be settled by the *IESO*. For information on procedures relating to the registration of *meter points* and submission of *meter* totalization tables, refer to [Market Manual 3: Metering Part 3.0: Metering Overview](#).

1.3.   Roles and Responsibilities

The following subsections describe how the responsibility for activities including the Participant Authorization and Register Equipment procedures, and maintenance and exit activities are shared between Participants or service providers and the *IESO*.

1.3.1.   Participant or Service Provider

The responsibilities of a Participant or a service provider include one or more of the following activities:

- read and comply with the applicable *market rules* pertaining to participant authorization and equipment registration (Chapter 2 and Chapter 7, section 2);
- complete all applicable pre-application requirements;
- provide all mandatory organization, Participant and *facility* contact information;
- manage system access requests for users requiring access to the *IESO* information systems;
- review, sign and submit the *participation agreement*;

Identity management operations is also part of Market Registration, and is described in [Market Manual 1: Market Entry, Maintenance & Exit Part 1.3: Identity Management Operations Guide.](#)

- submit *facility* and equipment registration data, supporting documentation, and supplemental information (*licence*(s), Single Line Diagram, etc.) through the *IESO*'s online registration system (Online IESO);
- identify the relationship roles for each *resource's* record in Online IESO (refer to section 3.1.4);
- submit responses to *IESO* requests for incomplete information or clarifications;
- submit appropriate registration data for participation in the *IESO-administered markets* (refer to sections 3.4 and 3.5);
- participate in *market participant* and *facility* testing (refer to section 3.3) as scheduled together with the *IESO*;
- register *variable generation facilities* to provide data for the centralized forecasting service program (refer to section 3.8, Appendix C, and Appendix D)[7];
- review and maintain Participant or service provider, *facility*, *resource* and equipment registration data in Online IESO to ensure the accuracy of the data, and submit any changes, additions or deletions through Online IESO (refer to section 4);
- submit a request to transfer the registration of a *facility* as a result of their intent to sell, lease, assign or transfer control of that *facility* (refer to section 4.2.7); and
- notify the *IESO* when they wish to deregister a *facility* or *facilities* that are being decommissioned (refer to section 5).

1.3.2.   IESO

The responsibilities of the *IESO* include the following activities:

- acknowledge prospective or existing Participant and service provider submissions related to Market Registration activities;
- manage records in Online IESO and Participant or service provider accessibility;
- generate the *participation agreement*, issue to the prospective Participant or service provider for signature and then execute at the *IESO* (refer to section 2.1.1);
- issue requests for incomplete data or clarifications;
- validate the completion of connection requirements coming from any applicable connection assessment;
- assess *facilities* for their ability to deliver the services for which they are seeking to be registered;

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[7] *Variable generators* that intend to connect directly to the *IESO-controlled grid* or participate in the *IESO-administered markets* are required to complete the requirements in Sections 2 and 3 of this *market manual*, along with the requirements in section 3.9 and Appendices C and D. *Distribution-connected variable generators* that are not registering to become *market participants* may bypass section 2 and all of section 3 prior to section 3.8.

- based on the *market participant*'s intended market operations, create appropriate setup of *facilities* and associated *resources* to enable *dispatch data* submission, *dispatching*, *metering*, and *settlement*[8];
- coordinate testing schedules with the Participant for Market Participant and Facility Testing (refer to section 3.2.5);
- provide the Participant with assistance in executing applicable commissioning tests for new or modified equipment (refer to section 3.9.1);
- validate a *facility*'s compliance with data monitoring and communication requirements as defined in the *market rules* and applicable standards and policies established by the *IESO* and other governing bodies[9];
- provide the Participant or service provider with appropriate operational *IESO* contacts; and
- issue Registration Approval Notifications ("RANs") to the Participant relating to the Market Registration activities.

1.4.   Recommended Reading

Before applying for participation in the *IESO-administered markets* or programs or as a service provider, the *IESO* recommends that each prospective Participant or service provider read the following information related to market rules, manuals, and other training and reference documentation.

1.4.1.   Market Rules

Chapter 2: Participation of the *market rules* contains material relevant to the Participant Authorization procedures and should be thoroughly reviewed by each prospective Participant or service provider for provision of services to the *IESO* as well as participation in the *IESO-administered markets* or programs. Chapter 7: System Operations and Physical Markets and Appendix 7.8: Market Power Mitigation of the *market rules* should also be thoroughly reviewed by applicants for participation in the *IESO-administered markets*.

1.4.2.   Market Manuals

Many of the procedures necessary for market involvement are interrelated. Therefore, it is strongly suggested that each prospective Participant or service provider review the entire set of *market manuals* before starting the Participant Authorization procedures. Particular attention should be paid to the *market manuals* listed in the References page at the end of this manual.

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[8] Metering information is contained in the Market Manual 3 series of manuals. *Settlements* information is contained in the Market Manual 5 series. Refer to the IESO Market Rules & Manuals Library.

[9] Other governing bodies include the North American Electric Reliability Corporation (*NERC*), Northeast Power Coordinating Council, Inc. (*NPCC*), as well as the Ontario government.

1.4.3.   Training and Reference Documents

The Marketplace Training page of the *IESO* website contains workbooks, training guides, and quick takes that *applicants* can use, specific to each participation type. Instructor-led courses are also available for applicants.

1.5.   Contact Information

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

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

– End of Section –

2.   Authorize Market and Program Participation

Any person planning to participate in the *IESO-administered markets* or programs, to cause or permit electricity to be conveyed into or out of the *IESO-controlled grid,* or to cause or permit electricity to be conveyed via an *IESO* contract requiring *settlement* by the *IESO*, must initiate with the *IESO* and complete a Request for Authorization.

The Participant Authorization procedures require prospective Participants or service providers to first register their organization by providing organizational information and signing the *participation agreement* to gain access to Online IESO. After prospective Participants or service providers have registered their organization, they can indicate their intent to the *IESO* to become authorized to participate as a Participant or service provider. Depending on the intent, the *IESO* will require additional information that the prospective Participant or service provider must complete in order for it to be authorized by the *IESO*. A prospective Participant or service provider will be considered authorized by the *IESO* only through the receipt of an authorization notification in the form of a RAN.

Before being authorized to participate in the *IESO-administered markets,* a prospective *market participant*, except for *a market participant* that is solely authorized as one or more of the participation types listed below, must complete the Register Equipment procedure described in section 3 of this *market manual:*

- capacity auction participant;
- TR participant;
- virtual trader; or,
- energy trader.

Registration requirements for *capacity market participants* are found in Market Manual 12.0: Capacity Auctions, section 5. Registration requirements for capacity export requests are located in Market Manual 13.1: Capacity Export Requests, section 6.6.

2.1.   Registering an Organization

Before starting the Participant Authorization Procedures, prospective Participants or service providers should review the Stage 4: Authorize market and program participation page of the *IESO* website. After reviewing the information, prospective Participants or service providers should complete the Online Application Form, which can be accessed from that page.

The Online Application Form is divided into four sections, which Table 2-1 describes.

Table 2-1: Online Application Form Descriptions

	Section	Contents and Description
1	**Organization Information**	This section contains the following fields: **Organization Name**, **Organization Short Name** (maximum of eight characters), **Address**, **Main Phone Number**, **Web Address** and **HST Registration Number** (if applicable).
2	**Active Organization Evidence**	This section contains: • **Business Entity Type:** prospective Participants or service providers identify the type of their business (e.g., corporation, LLP, proprietorship, etc.), business identification number (if applicable) and jurisdiction of registration[10]. • **Intent of Registration:** prospective Participants or service providers identify if they intend to register as a Participant or a service provider.
3	**Mandatory Organization Contacts**	This section identifies at least one person (preferably more) in the organization for each of the following contact types. Click the links for more information on each type. • **Authorized Representative:** Person(s) responsible for contractually binding an organization with the *IESO*. The Authorized Representative is required to sign the *participation agreement* (described in section 2.1.1). • **Primary Contact:** Person(s) responsible for the organization's day-to-day interactions with the *IESO*. • **Rights Administrator:** Person(s) responsible for submitting and managing the organization's system access requests for users requiring access to *IESO* information systems. • **Applicant Representative:** Person(s) responsible for submitting registration requests for adding and updating contacts, *facilities*, organization, or different participations on behalf of the organization. The step-by-step guide to adding contact roles will assist an Applicant Representative in adding and updating contact roles. Organization contact roles are listed and defined in Appendix A. Mandatory organization information must always be kept up-to-date. For information on changing a mandatory contact, refer to section 4.1.4.
4	**Submitter's Contact Information**	The section collects the name and contact information of the person who will be the *IESO*'s point of contact for the registration process.

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[10] The *IESO* will conduct a business registry search to confirm evidence of an active organization, including the registered officers, and current status.

The submitted data on the online application will require validation and approval by the *IESO*. In some cases, the submitted data may need to be revised by the prospective Participant or service provider before it is approved. Once approved, the *IESO* will create organization and contacts records in Online IESO (refer to section 2.1.3) using the submitted data. These records will be the online repository for all of the prospective Participant or service providers' data and documents related to their participation in the *IESO-administered markets* or programs.

> **Note:** As of late 2020, the **Intent of Registration** section of the online application form is in a state of transition. In the future, the *IESO* intends to have this section set so that it contains only the **Market Participant**, **Program Participant**, and **Service Provider** options. Until this change is in place, please select the check box(es) that best indicate the intended participation type. The options are explained in sections 2.2.2, 2.3.2, and 2.4.2.

2.1.1.   Participation Agreement

(Market Rules: Chapter 2, section 1.2.2.3)

Once the organization and contact records in Online IESO are established, a *participation agreement* is generated, printed and sent by courier to the prospective Participant's authorized representative, who must sign it and return it to the *IESO*[11]. A signed *participation agreement* is required for each person that intends to participate as a Participant or a service provider.

The *participation agreement* formally binds a Participant or service provider to the *market rules* and other applicable standards, policies, or procedures established by the *IESO* and other governing bodies. It also serves as certification by the organization of readiness to participate in the *IESO-administered markets* or programs. Once the *IESO* receives the signed *participation agreement*, the appropriate *IESO* representative reviews and executes the *participation agreement*, at which point it is considered to be official and final. The *IESO* sends a hard copy of the executed *participation agreement* to the prospective Participant or service provider for their records.

2.1.2.   Initial Access to Online IESO

Once the *IESO* executes the *participation agreement*, it provides initial access to Online IESO to all of the prospective Participant or service provider's mandatory organization contacts, for which they will be notified via email from Online IESO. The initial access allows applicable mandatory contacts to complete their assigned **Manage Participation** tasks found in the **Actions** section in Online IESO.

The Logging in to Online IESO for the first time guide will assist users when logging into Online IESO for the first time.

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[11] Under extraordinary circumstances, the *IESO* may email the *participation agreement* to the prospective Participant's authorized representative.

2.1.3.   Manage Participation Tasks

Prospective Participants or service providers that have registered their organization with the *IESO*, indicated their authorization intent and have received access to Online IESO can authorize as a Participant or service providers.

The Applicant Representative needs to log in to Online IESO and initiate the Manage Participation action. Once initiated, the Applicant Representative will receive a series of emails, which contain assigned submission tasks that must be completed in Online IESO. These include identifying the specific *market participant*, program participant, and/or service provider types for which the prospective Participant or service provider is registering. *Market participant* and program participant types are defined in section 2.2.2 and section 2.3.2. Service provider types are described in section 2.4.2.The majority of submission tasks are listed on the Stage 4: Authorize market and program participation page of the *IESO* website and are explained in further detail in section 2.2.1. Some of these tasks require approval by the *IESO*, and may be rejected by the *IESO*, requiring further follow-up by the Applicant Representative before participation can be authorized.

2.2.   Registering as a Market Participant

(Market Rules: Chapter 2, sections 1, 2, 3, 4, 5, 6 and 10)

2.2.1.   Prerequisite Requirements for a Prospective Market Participant

Before registering as a *market participant* in the *IESO-administered markets*, a prospective *market participant* must submit the information described in Table 2-2 through Online IESO. The prospective *market participant* may contact the *IESO* at market.registration@ieso.ca for additional information about requirements that may be applicable for their intended participation type.

Table 2-2: Prerequisite Requirements for a Prospective Market Participant

Type	Description
IESO Market Entry Application Fee	The *IESO* charges an application fee for authorization of market participation.
Ontario Energy Board Licence	The *Ontario Energy Board ("OEB")* is responsible for licensing all *market participants* in the *IESO-administered markets*. Prospective *market participants* must have an *OEB licence* for each market participation type (refer to section 2.2.2) for which they intend to conduct market activities (market rules: Chapter 2, section 1.2.2.4). The OEB licence required for each market participation type is described in Table 2-3.
Canadian Bank Account	Prospective *market participants*, for whom billing and effecting payment in respect of financial obligations or transactions will be processed by the *IESO*, are required to have Canadian bank account(s). Each prospective *market participant* to be paid or invoiced by the *IESO* must submit relevant bank account details.
Import/Export/ e-Tag Data	Prospective *market participants* seeking authorization as an *energy trader* are required to identify all *interties* between the *IESO control area* and adjacent *control areas* across which they wish to import, export or wheel *energy* and import or export *operating reserve*[12] as stated in Chapter 7, section 2.2.7 of the *market rules*. These prospective *market participants* must obtain the relevant e-Tag[13] capability and submit relevant data associated with the e-Tag. The e-Tag specifications and schema are maintained by the North American Energy Standards Board ("NAESB") and facilitate the processes required by the NERC and NAESB standards related to *interties*.

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[12] Market participants may import energy and operating reserve but can only export energy.

[13] For information on e-Tags, refer to the North American Energy Standards Board website.

Type	Description
Canada Energy Regulator Permit	Prospective *market participants* seeking authorization as *energy traders* to export or wheel electricity over *interties* between the *IESO control area* and adjacent *control areas* must obtain export permits issued by the [Canada Energy Regulator ("CER")](#) and must submit the permits to the *IESO*.
Harmonized Sales Tax Registration Number	Prospective *market participants* seeking authorization as *market participants*, where billing and effecting payment in respect of financial obligations or transactions will be processed by the *IESO*, must obtain an Harmonized Sales Tax (HST) registration number[14].
	Prospective *market participants* to be paid or invoiced by the *IESO* must submit an HST registration number.
	Prospective *market participants* that intend on solely participating as either a *TR participant, a virtual trader* or a *capacity auction participant* are not required to submit an HST registration number but must indicate their intent in the HST Registration Number field of the Online Application Form.
Prudential Support	Prospective *market participants* seeking authorization to participate in the *IESO-administered markets* are required to meet the *prudential support obligations* set out in Chapter 2 of the *market rules* and in [Market Manual 5: Settlements Part 5.4: Prudential Support](#). Each prospective *market participant* must submit evidence of prudential support for approval by the *IESO*. Those seeking authorization as a *capacity auction participant* or *TR participant* are excluded and do not need to meet these requirements. For more information, refer to the [Guide to Prudentials at the IESO](#).

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[14] For information on HST registration, refer to the [Canada Revenue Agency website](#).

Type	Description
Emergency Preparedness Plan	Most prospective *market participants* are required to prepare and submit an *emergency preparedness plan* for approval by the *IESO*. Prospective *market participants* intending to: • authorize as a *capacity market participant*, *distributor*, *generator*, *wholesale consumer*, electricity storage participant or *transmitter* are required to complete and submit an *emergency preparedness plan* that meets all applicable requirements in sections 2 and 3 of the [Market Participant Emergency Plan Guidelines & Requirements](#) document; • authorize as an *energy trader* are required only to submit a single-page *emergency preparedness plan*, as provided in the template in section 2 of the [Market Participant Emergency Plan Guidelines & Requirements](#) document; • authorize solely as a capacity auction participant, TR participant or virtual trader are not required to submit an emergency preparedness plan. Existing and prospective *market participants* seeking to register a *price responsive load* are subject to the same *emergency preparedness plan* requirements as a *non-dispatchable load*. *Emergency preparedness plan* signoff must be obtained by at least one of the following authorities: CEO, CFO, COO, CIO, President, Vice-President, or Legal Counsel/Secretary. Chapter 5, section 11 of the *market rules* describes the content requirements for an *emergency preparedness plan*. For more information on EPP preparation, refer to: [Market Manual 7: System Operations Part 7.10: Ontario Electricity Emergency Plan (OEEP)](#), Appendix C [Market Participant Emergency Plan Guidelines & Requirements](#)
[Market Control Entity](#)	Prospective *market participants* seeking authorization as only one or both of a virtual trader or *energy trader* are required to disclose their *market control entities*.

2.2.2.   Market Participant Types

Prospective *market participants* select their applicable *market participant* types in Online IESO. Table 2-3 lists the available *market participant* types and the markets in which they are eligible for participation.

Table 2-3: Market Participation Types

Participation Type	Scope of Market Participation
Capacity Auction Participant	A person who participates in the *capacity auction* and submits *capacity auction offers*. For more information on *capacity auctions*, refer to Market Manual 12.0: Capacity Auctions. *Capacity auction participants* do not require an *OEB* licence.
Capacity Market Participant	A *capacity auction participant*, who secures a *capacity obligation* through a *capacity auction* and satisfies the requirements contemplated in Chapter 7, section 18 of the *market rules*. *Capacity market participants* may participate in the *day-ahead market* and *real-time market*. For more information on *capacity auctions*, refer to Market Manual 12.0: Capacity Auctions. *Capacity market participants* participating using a *demand response resource* do not require an *OEB* licence.
Distributor	A person who owns or operates a *distribution system. Distributors* may participate in the *energy market* only. *Distributors* must hold an electricity *distributor OEB* licence.
Electricity Storage Participant	Electricity storage participants may participate in the *day-ahead market, real-time market* and *procurement market*. An electricity storage participant may hold an electricity storage or electricity *generator OEB* licence.
Energy Trader[15]	A person who participates in the *energy* and *operating reserve* markets by importing, exporting, or wheeling electricity[16] must register as an *energy trader*. Participation in the *operating reserve market* is restricted to *energy traders* that intend to import *energy. Energy traders* must hold an electricity wholesaler *OEB* licence. *Energy traders* are classified as *wholesale sellers* (Chapter 2, section 2.1.1 of the *market rules*).

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[15] A *generation facility* owner who intends to pursue *capacity export* opportunities (either as a Prospective Capacity Seller or a Capacity Seller) must register as an *energy trader*, or arrange for another *energy trader* to act on their behalf. For information on *capacity exports*, refer to Market Manual 13.1: Capacity Export Requests.

[16] Imports and/or export trades are from or to the Ontario *energy market*. For example, a *market participant* seeking to export *energy* from a *facility* within Ontario will have to submit both an *offer* for that *energy* into the Ontario real-time market and a *bid* to export that *energy* into another *control area*. The first *offer* would be associated with the resource that is registered with the *IESO*. The second *offer* would be associated with a *boundary entity resource*. Refer to Market Manual 4: Market Operations Part 4.2: Submission of Dispatch Data for more information on this process.

Participation Type	Scope of Market Participation
Generator	A person who owns or operates a *generation facility*. *Generators* may participate in the *energy market, operating reserve market* and *procurement market*. *Generators* must have an electricity *generator OEB* licence.
Retailer	*Retailers* may participate in the financial markets for *settlement* purposes only. They must have an electricity retailer *OEB* licence.
Regulation Service Provider	A *regulation* service provider may participate in the *procurement market*. A *regulation* service provider must also be authorized as a *generator* or electricity storage participant.
Transmitter	*Transmitters* may participate in the *energy market*. They must have an electricity *transmitter OEB* licence.
TR Participant	A person who is authorized to participate in the *TR market*. For information on the participation in the *TR market*, refer to [Market Manual 4: Market Operations Part 4.4: Transmission Rights Auction](#) and Chapter 8, section 4.8 of the *market rules*. *TR participants* do not require an *OEB* licence.
Virtual Trader	A person who is authorized to conduct *virtual transactions*. Virtual traders that are eligible to participate in the *energy market*. *Market participants* authorized solely as virtual traders shall not participate in the *operating reserve market*. *Virtual traders* may submit *dispatch data* in the *day-ahead market* only. V*irtual traders* do not require an *OEB* licence.
Wholesale consumer	A person who owns or operates a *load facility*. *Wholesale consumers* may participate in the *energy market* and *operating reserve market*. *Wholesale consumers* that participate in the *operating reserve market* must be *dispatchable loads*. *Wholesale consumers* must have an electricity wholesaler *OEB* licence.

2.2.3.   Organization Roles and Responsibilities

Table 2-4 describes the organization roles applicable to *generators*, *wholesale consumers*, and *capacity market participants*. One organization may fill one, more, or all of the roles, depending on its qualifications and responsibilities. In all cases, any organization fulfilling a role must be authorized as a *market participant*.

Table 2-4: Organization Roles and Responsibilities

Role	Responsibility
Owner	The *market participant* who owns and maintains a *facility* or specific equipment within a *facility*. The owner is responsible for completing the Register Equipment procedure and assigning the *registered market participant*,

Role	Responsibility
	metered market participant and operator role relationships to equipment or *resources* if applicable.
Operator	The *market participant* responsible for operating the equipment within a *facility* in the real-time operations.
Registered Market Participant	The *market participant* responsible for submitting *dispatch data* for an *energy resource* to which they have been assigned.
Metered Market Participant	The *market participant* responsible for accessing *metering data* pertaining to, and to be settled at, the relevant *delivery point*. Each *delivery point* requires the assignment of a *metered market participant*.
Metered Market Participant Transmission	The *market participant* responsible for paying for one or more transmission services to a *transmitter* relating to an owned *facility*.

2.3. Registering as a Program Participant

2.3.1. Prerequisite Requirements for a Prospective Program Participant

Prospective program participants registering in one or more *IESO* programs where billing and effecting payment in respect of financial obligations or transactions will be processed by the *IESO*, but who are not registering as a *market participant*, must submit the information described in Table 2-5 through Online IESO. Prospective program participants can contact the *IESO* at market.registration@ieso.ca for additional information about requirements that might be applicable for their intended participation type.

Table 2-5: Prerequisite Requirements for a Prospective Program Participant

Type	Requirements
Canadian Bank Account	Prospective program participants that need to be paid or invoiced by the *IESO* must have a Canadian bank account and must submit relevant bank account details to the *IESO*.
HST Registration Number	Prospective program participants that need to be paid or invoiced by the *IESO* must obtain an HST registration number[17] and submit it to the *IESO*.

2.3.2. Program Participant Types

If applicable, prospective program participants can select the program participant type in Online IESO. Table 2-6 describes the available program participant types.

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[17] For information on HST registration, refer to the Canada Revenue Agency website.

Table 2-6: Program Participant Types

Type	Description
Centralized Forecasting Provider	A person with wind and solar *generation facilities* (i.e., *variable generators*) connecting to the *IESO-controlled grid*, or connecting to a *distribution system* with an installed capacity of 5 MW or greater. These persons must participate in the centralized forecasting program and be authorized as a Centralized Forecasting Provider. Refer to section 3.7 for more information.
Embedded Generator	A person with embedded facilities (i.e., *connected* to a *distribution system*) that are not wind or solar generation. An *embedded generator* is not required to be a *market participant*. An *embedded generator* that is an *embedded market participant* can participate in the *operating reserve market* only.
Embedded Load	A person that participates with an *embedded load facility* that is not directly *connected* to the *IESO-controlled grid*, but is instead embedded within a *distribution system*. This person is not required to be a *market participant*. An embedded load is represented as an *embedded load consumer*.
Energy Performance Program	A person that participates in the Province-wide Energy Performance Conservation and Demand Management Program for Multi-Site Customers.
Industrial Accelerator	A person that is eligible to participate in the Industrial Accelerator Program, which is designed to assist eligible transmission-connected companies to fast track capital investment in major energy-efficiency projects.
Program Non-Specific	A person participating in an *IESO* program that is not listed in Online IESO.
Smart Metering Cost Recovery	A person that has a financial *settlement* with respect to the smart metering charge.
Smart Submetering Provider	A person who has a financial *settlement* with respect to Ontario Clean Energy Benefit Program Government electricity support program as a Smart Unit Submetering Provider.

2.4.   Registering as a Service Provider

2.4.1.   Prerequisite Requirements for a Prospective Service Provider

Persons registering as a service provider where billing and effecting payment in respect of financial obligations or transactions will be processed by the *IESO*, but who are not registering as a *market participant*, must submit the information described in Table 2-7 through Online IESO. Prospective service providers can contact the *IESO* at market.registration@ieso.ca for additional information about requirements that might be applicable for their intended participation type.

Table 2-7: Prerequisite Requirements for a Prospective Service

Type	Description
Canadian Bank Account	Prospective service providers that need to be paid or invoiced by the *IESO* must have a Canadian bank account and must submit relevant bank account details to the *IESO*.
HST Registration Number	Prospective service providers that need to be paid or invoiced by the *IESO* must obtain an HST registration number[18] and submit it to the *IESO*.

2.4.2. Service Provider Types

If applicable, prospective service providers can select their service provider type in Online IESO. Table 2-8 describes the available service provider types.

Table 2-8: Service Provider Types

Type	Description
Centralized Forecasting Provider	A *forecasting entity* that provides a centralized forecasting service relating to *variable generation*.
Metering Service Provider	A person that provides, installs, commissions, registers, maintains, repairs, replaces, inspects and tests *metering installations* associated with a *resource*. For more information, refer to Market Manual 3: Metering Part 3.8: Creating and Maintaining Delivery Point Relationships.
Meter Data Associate	A person, other than the *metered market participant* that has access to metering data. The *metered market participant* assigns access to this data to the meter data associate (refer to section 3.1.5, Table 3-2).

2.5. IESO Notification of Participant Authorization

2.5.1. Authorization Notification for a Market Participant

After the Applicant Representatives of prospective *market participants* have completed their assigned submission tasks in Online IESO, a RAN will be emailed to the Applicant Representatives. The RAN is the confirmation that the prospective *market participants* have been approved by the *IESO* to participate in the *IESO-administered markets* they requested in their authorization tasks.

After the *IESO* issues the RAN, the person is officially deemed to be a *market participant*. New *market participants* can now begin the Register Equipment procedure described in section 3.

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[18] For information on HST registration, refer to the Canada Revenue Agency website.

2.5.2.   Authorization Notification for a Program Participant

The Applicant Representative of a prospective Participant for participation as:

- a centralized forecasting provider;
- an embedded generator; or
- an embedded load consumer,

who has completed their assigned submission tasks in Online IESO, will receive a RAN emailed from the *IESO* notifying them of their authorization for participation.

Prospective program participants for participation in other *IESO* programs (refer to section 2.3.2) are notified of their authorization by email from *IESO* Energy Efficiency.

2.5.3.   Authorization Notification for a Service Provider

The Applicant Representatives for service provider (refer to section 2.4.2), who have completed their assigned tasks in Online IESO, are notified of *IESO* authorization by an email from *IESO* Metering.

– End of Section –

3.   Register Equipment

The *IESO* uses the Register Equipment procedure to collect specific data. This data is used for various purposes that include assessing or validating whether a *facility* and its equipment meet all connection obligations identified in a related *connection assessment* and all requirements defined by the *market rules.* The Register Equipment procedure is outlined on the Stage 5: Register equipment page of the *IESO* website (refer also to the Register equipment process diagram). The data that applicable Participants need to submit are described in greater detail in the Register Equipment Help File.

Subject to certain caveats in the *market rules*, the *IESO* requires that *market participants* register all *facilities* directly *connected* to the *IESO-controlled grid*, with a capacity of 1 MW or greater, providing an *ancillary service*, or having a contract with the *IESO*. All *market participants* with the exception of *market participants* authorized solely as one or more of the participation types below must complete the Register Equipment procedure in order to participate in the *IESO-administered markets* or convey energy through, into or out of the *IESO-controlled grid*:

- *TR participant: market participants* authorized as a *TR participant* do not have any *facility* or *resource* registration requirements. Upon receipt of the authorization RAN from the *IESO*, *TR holders* will be eligible to participate in the *TR market* as *TR participants*;

- energy trader: boundary entity resources of market participants authorized as energy traders do not have any resource registration requirements. Boundary entity resources are created by the IESO. Each energy trader has access to the boundary entity resources associated with interties identified by e-tag submission in the Participant Authorization process;

- *virtual trader:* a *virtual trader* does not have any *facility* or *resource* registration requirements. Each *virtual trader* is granted access to submit *virtual transactions* into the *day-ahead market* at all *virtual transaction* zonal trading entities that are defined and maintained by the *IESO*; and

- capacity auction participant: a capacity auction participant does not have any facility or resource registration requirements.

The Register Equipment procedure enables the *IESO* to complete all activities required to prepare their staff, systems, tools, or operational documentation to accommodate the new or modified *facility*, equipment and associated *resources*. These activities include, but are not limited to:

- understanding operational capabilities and impacts;

- maintaining operating limits;

- identifying where compliance with *NERC reliability standards* and *NPCC* criteria is required;

- establishing visibility via data monitoring; and

- establishing *resources* for market operations and *settlement* systems.

Throughout the Register Equipment procedure, the *IESO* will issue interim RANs to Participants upon the completion of an activity in the Register Equipment procedure. The Register Equipment procedure is completed when the Participants receive a final RAN from the *IESO.* The final RAN allows a *facility* to connect to the *IESO-controlled grid* and, for a *market participant*, allows it to participate in the *IESO-administered markets* in which one or more of its *resources* are authorized to participate*.* Additional details on RANs issued during the Register Equipment procedure are found in section 3.2.4 of this *market manual*.

3.1.   Register Equipment Overview

The following subsections contain prerequisite requirements, roles and responsibilities information, *market participant* and equipment relationships, *market participant* and *resource* relationships and other background information that organizations having an owner role (refer to section 2.2.3) should review before starting the Register Equipment procedure .

3.1.1.   Prerequisite Requirements

Depending on the scope of the equipment change (e.g., a new *facility* or a modified *facility* registered with the *IESO*), the *facility* owner (refer to section 2.2.3) must complete the applicable requirements described in Table 3-1.

Note: All of the requirements listed in Table 3-1 (except for the CAA process and Participant Authorization procedures) are considered by the *IESO* to be supporting documentation.

Table 3-1: Prerequisite Requirements for Register Equipment

Requirement	Description
Complete Connection Assessment and Approval ("CAA") Process	As per the requirements of Market Manual 1: Connecting to Ontario's Power System Part 1.4: Connection Assessment and Approval, prospective and existing *market participants* and *embedded generators* must complete the CAA process and receive a Notification of Conditional Approval to Connect from the *IESO*.
	During the *connection assessment* process, Participants must confirm with the *IESO* the number of *resources* required at their *facility*. The *IESO* will determine the number of *resources* based on the number of transformers at the *facility*.
	As part of the Register Equipment procedure, proponents or *market participants* are required to provide evidence that they meet any connection obligations identified in the connection assessment before the *IESO* issues a final RAN. Refer to section 3.2.4.
	For more information on the CAA process, refer to the Stage 2: Obtain conditional approval to connect page of the *IESO* website.
Complete Participant Authorization Procedures	Refer to section 2.
	Note: Once an applicant has been granted access to Online IESO (refer to section 2.1.2), they may begin their applicable Register Equipment procedures,

Requirement	Description
	as described in sections [3.1](#) through [3.8](#). However, the Register Equipment procedures cannot be completed until the *IESO* has issued a RAN for Participant Authorization. Refer to [section 2.5.1](#).
Prepare Single-Line Diagram	Each *market participant* must provide a station electrical diagram showing the new or modified *facility* and its connection path to the *IESO-controlled grid*. The Single-Line Diagram must have enough detail to allow the *IESO* to establish data monitoring requirements (refer to Figure 3-1) and to implement modeling changes in *IESO* systems and tools. A Single-Line Diagram is required for all facilities being registered for participation in the *IESO-administered markets*, and shall be annotated with data monitoring, including the location of the Dynamic Disturbance Recorder and/or equivalent. *Market participants* can submit their Single-Line Diagrams via [Online IESO](#).
	Prior to submitting a Single-Line Diagram to the IESO, *market participants* shall confirm that the Single-Line Diagram:
	• is accepted by their *transmitter* or *distributor*;
	• contains the appropriate approved operating nomenclature that is used by the *market participant's transmitter*, and not the engineering nomenclature;
	• shows the electrical equipment at the *facility* and the *connection points* to the grid;
	• shows as-built[19] data approved for construction, and marked with an Ontario Professional Engineer's seal; and
	• clearly references the *market participant's* name, and the *facility* name to be registered in Online IESO.
Prepare Protection Description Document	*Market participants* must prepare a document marked with an Ontario Professional Engineer's seal containing written descriptions of all protections and settings (e.g., A, B, primary, or backup), communication schemes, and tele-protections for each protection group at the new or modified *facility*. The Protection Description Document includes local and remote estimated design fault clearing times, a tripping matrix and (where applicable) describes the separation of redundant protection groups.
	The *IESO* can provide a template upon request.
Prepare Operational Philosophy Document	*Market participants* must prepare a document attesting to their *facilities'* operating conditions and limitations (e.g., common mode failures, high/low temperatures, high/low wind speed), and procedures for *planned* and *forced outages*, returning equipment to service, responding to *IESO* directives within five minutes, and training staff on *IESO* interaction.

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[19] "As-built" data consists of the measurements and specifications of a *facility* prior to any modifications, and is submitted to the *IESO* on a single-line diagram. Confirming as-built equipment in some cases may be as simple as confirming nameplate values are provided during equipment registration. In other cases, data monitoring will be used to confirm model parameters.

Requirement	Description
	Variable generators must also provide a description of the power equipment and power curves. Refer to Appendix C: Wind Facility Data Requirements. The *IESO* provides a template of what is required in the operational philosophy document when registering a new *facility*.
Obtain Technical Data	The Register Equipment procedures in Online IESO will require technical data for equipment to be submitted and then reviewed and approved by the *IESO*. These procedures might require some time and several iterations to complete. *Market participants* must start these tasks as early as possible. The specific technical data required is identified in the Register Equipment Help File..
Review Operational and Performance Requirements	The technical requirements and associated performance standards for each type of *facility* are stated in the *market rules* (refer to Appendix B) and in Market Manual 6: Participant Technical Reference Manual.
Execute Connection Agreement	For a *facility* to participate in the *IESO-administered markets*, the *facility* owner must submit an executed copy of their *connection agreement* with the applicable *transmitter* (if the connection is to the *IESO-controlled grid*) or with the applicable *distributor* (if the connection is to the *distribution system*).
Prepare Restoration Participant Attachment	Based on the criteria contained in Market Manual 7: System Operations Part 7.8: Ontario Power System Restoration Plan (OPSRP), section 2.2, and as identified in the applicable System Impact Assessment, certain *market participants* are designated as restoration participants. Restoration participants are entities that contribute to the *IESO-controlled grid* restoration process. Restoration participants are required to submit a Restoration Participant Attachment via Online IESO as outlined in Market Manual 7: System Operations Part 7.8: Ontario Power System Restoration Plan, Section 13.
Prepare Facility Description Document	In some situations, as identified in a System Impact Assessment, a new or modified *facility* may need to participate in Remedial Action Schemes, special protection systems, or other specialized control schemes. This includes Generation or Load Rejection Schemes, Generation Run-Back Schemes, Capacitor Switching Schemes, or Breaker Backup Protections. These are not typical protection system installations. For such *facilities*, *market participants* must prepare Facility Description Documents, marked with an Ontario Professional Engineer's seal, and submit them for review and approval by the owner of Remedial Action Schemes, special protection systems, or other specialized control schemes. Facility Description Documents contain a description of how the Remedial Action Scheme, special protection system, or specialized control scheme operates, when and under what conditions, and the estimated design operating times. A block diagram showing the configuration, and functions, and (where applicable) the separation of the redundant functions is also submitted.

Requirement	Description
Other Supporting Documentation	Other supporting documentation may include items such as nameplate photos, synchronous machine capability curves, manufacturer's wind turbine power curves or solar array power data.

3.1.2.   Equipment Registration Specialist

The Applicant Representative (refer to section 2.1) must assign an Equipment Registration Specialist contact role. The Equipment Registration Specialist is responsible for initiating and completing tasks, including submitting technical data through Online IESO for their *facility*, its equipment, and any applicable *resources*. Online IESO will guide the Equipment Registration Specialist to submit the data that is required. As defined in the Register Equipment Help File, this data may apply to some types of *market participants* and not others, and the *IESO* may require supporting documentation (refer to Table 3-1) to verify the data. Once the *IESO* reviews and approves the data, they are considered to be registered data with the *IESO*.

The Equipment Registration Specialist is also responsible for assigning specific *facility* contacts, including:

- the 24/7 contact responsible for operating equipment at the *facility* location; and
- if applicable, the *facility* contact responsible for carrying out *dispatch instructions*.

3.1.3.   Market Participant/Equipment Role Relationship

The key role relationships between a *market participant* and equipment are owner and operator, as described in section 2.2.3.

3.1.4.   Facility/Resource Relationship

The *IESO* creates *resource* and *facility* data record types in Online IESO for each *facility* it registers. Establishing a relationship between a *facility* and one or more *resources* ensures that a *facility* is properly represented in the *IESO-administered markets* and in the *IESO* systems and tools. This is illustrated in the Single-Line Diagram in Figure 3-1, where a fictitious company GenCo owns a *generation facility* consisting of one combustion turbine and one steam turbine connecting to a common *connection point*.
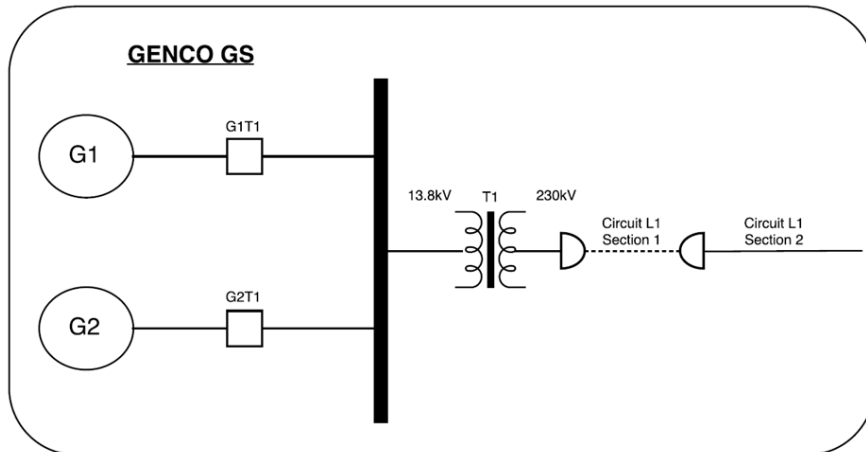
Figure 3-1: Single-Line Diagram Example

The *generation facility* would be registered in Online IESO as GenCo GS and would include all physical equipment that comprise the *facility* (e.g., *generation units*, transformers, circuits, and breakers) and their associated technical data. The *IESO* would create two *resources* for this *facility*. The first *resource* would be identified as Genco-LT.G1 and would include information provided by the *generator* that is the owner of *generation unit* G1. The second *resource* would be identified as Genco-LT.G2. It includes information provided by the *generator* that is the owner of *generation unit* G2.

As per the Chapter 7, section 2.3 of the *market rules*, the *generator* may apply to the *IESO* to aggregate the *generation units* into a single *resource*, and must provide technical justification as to why the aggregation is necessary (refer to section 3.7).There may be a 'one-to-many' relationship between a *connection point* and a *resource* (i.e., one *connection point* can have many *resources* associated with it). For example, a *distributor* might own a *load facility connected* to the *IESO-controlled grid* and be registered with a *resource* at that *connection point*. If a *dispatchable generation unit* is embedded in the same *distribution system*, that *generation unit* would be registered as a separate *resource* associated with the same *connection point*. In other words, the *generation resource* must be distinguished from the *load resource* even though the *generation resource* is embedded in the *distribution system*. Both *resources* have the same *connection point* because they both inject or withdraw *energy* into or from the *IESO-controlled grid* at the same physical *connection point*.

3.1.5.   Market Participant-Resource Role Relationships

In addition to the *facility/resource* relationships, establishing role relationships between *market participants* and *resources* is also important. Various role relationships are possible. Some are required by the *market rules* and others are determined by the business requirements of the owner.

Each *resource* may have role relationships with several different *market participants*. However, each role relationship must be unique. For example, if a *market participant* has been designated

as the *metered market participant* for a *resource*, a second *market participant* cannot be similarly designated as the *metered market participant* for that same *resource*.

One *market participant* may fill one, more, or all of the role relationships, depending on their qualifications and responsibilities. The *market participant* assigned as a *registered market participant*, *metered market participant* or *metered market participant transmission* must have that corresponding role assigned to its organization.

Table 3-2 lists the role relationships that are assigned by the *market participant* for each *resource.*

Table 3-2: Market Participant/Resource Role Relationships

Role	Responsibility
Owner	The *market participant* who owns and maintains a *facility* registered with the *IESO* and any associated *resources,* including *hourly demand response resources* (Chapter 7, section 2.2.6.1 of the *market rules*). Only one owner may be assigned to each *resource*. The owner is responsible for completing the Register Equipment procedures and assigning the *registered market participant*, *metered market participant* and operator role relationships to equipment or *resources* if applicable. The owner is also responsible for assigning an Equipment Registration Specialist as described in section 3.1.2.
Operator	The *market participant* responsible for operating the equipment within a *facility* in the real-time operations (Chapter 7, section 2.2.6.1 of the *market rules*)*.* Only one operator may be assigned to each *resource*.
Registered Market Participant	The sole *market participant* responsible and authorized to submit *dispatch data* for the *resource* to which it has been assigned (Chapter 7, section 2.2.4 of the *market rules*). The *registered market participant* is also responsible for assigning *registered market participant* user-*resource* relationships that allow individual users to submit *dispatch data* for the assigned *resource*.
Metered Market Participant	The *market participant* responsible for the financial *settlement* with the *IESO* of all quantities of *physical services* at the relevant *delivery point* for the *resource* as part of the *settlement process.* The *metered market participant* assigns further relationships required for a *delivery point* as detailed in Market Manual 3: Metering Part 3.8: Creating and Maintaining Delivery Point Relationships. Only one *metered market participant* may be assigned to each *delivery point*. The *metered market participant* assigned to the *day-ahead market* must be the same *metered market participant* assigned to the *real-time market*.

Role	Responsibility
	Metered market participants must contract with a *metering service provider* for their metered *resources*. The *metered market participant* assigns the *metering service provider* relationships to the *delivery point* for the *resource.* Each *delivery point* requires the assignment of a *metered market participant*.
Metered Market Participant Transmission	The *market participant* responsible for paying for one or more transmission services to a *transmitter* relating to an owned *facility*.
Metering Service Provider	Provides, installs, commissions, registers, maintains, repairs, replaces, inspects and tests *metering installations* associated with a *resource*. For more information, refer to Market Manual 3: Metering Part 3.8: Creating and Maintaining Delivery Point Relationships.
Meter Data Associate	A service provider appointed by an *metered market participant* to access *metering data* pertaining to the *resource*'s *delivery point*. For more information, refer to Market Manual 3: Metering Part 3.8: Creating and Maintaining Delivery Point Relationships.
Distributor	The *market participant* that owns and operates a *distribution system* where the *facility* associated with a *resource* is *connected*.
Transmitter	The *market participant* that owns and operates a *transmission system* where the *facility* associated with a *resource* is *connected*. The *transmitter* may create a transmission network (TN) *resource* or a transmission connection (TC) *resource* for the *facility* for the purpose of collecting the applicable transmission tariff.
Market Control Entity	One or more entities that must be disclosed by applicable *market participants* for a the following *resource* types during the Register Equipment process: • *generation resource*; • *price responsive load;* and • *dispatchable load.*
Market Control Entity for Physical Withholding	A single entity that must be disclosed by applicable *market participants* for the following resource types during the Record Equipment process: • *dispatchable generation resources;* or • *dispatchable load resources.*

3.2. Registering Facility, Equipment, and Resource Data

To complete the Register Equipment procedure, the Equipment Registration Specialist might need to submit certain supporting documents and equipment data (as described in section 3.1.1) via Online IESO. This also includes all data related to equipment changes. Online IESO will guide the Equipment Registration Specialist on what kind of supporting documents are required for all *facilities* and the specific documents that are required only under certain circumstances. The *IESO* will review and assess all submitted data. If any data is determined to be inaccurate, incomplete or missing, the *IESO* will reject it and the Equipment Registration Specialist will need to resubmit updated data.

> **Important**: It is critical that *market participants* review their registered data in Online IESO to ensure that it is accurate and current. The procedures for changing *market participant*, *facility*, equipment, and *resource* data are contained in section 4.

The required data attributes that need to be submitted when completing the Register Equipment procedures through Online IESO are detailed in the Register Equipment Help File.. The *IESO* ensures that all *facility* data provided by owners are referenced appropriately in Online IESO in the *facility* records that contain technical data related to the physical equipment within the *facility.*

Sections 3.3 through 3.7 identify additional registration data that the *IESO* may require depending on the *facility* and participation type.

3.2.1. Metering Requirements

After a *market participant* has applied to register a *facility* with the *IESO,* and one or more *resource* records have been created in Online IESO, the *market participant* must identify the *metered market participant* for each *resource* record. The *metered market participant* will assign a *metering service provider* to satisfy the metering requirements for the *resource*.

Information on procedures relating to metering registration can be found in the Meter Registration section of the *IESO* website, as well as in the Market Manual 3: Metering series, available at the IESO Market Rules & Manuals Library.

The metering registration procedures cannot be completed until the *metered market participant-resource* relationship is created (refer to section 3.1.5) and the *IESO* has issued a RAN via Online IESO.

3.2.2. Data Monitoring Requirements

All *facilities* must comply with the applicable data monitoring requirements, which are listed in the Market Rule Chapter 4 Appendices. Data monitor testing is explained in section 3.2.5.3.

3.2.3. Market Rule Exemptions

(Market Rules: Chapter 1, section 14)

The procedure for applying for an *exemption* from any applicable *market rule* requirement is contained in Market Manual 2: Administration Part 2.2: Exemption Application and Assessment.

3.2.4. Facility Registration Status

Equipment Registration Specialists can track the progress of their Register Equipment procedures by accessing the Manage Facility Requests Report in Online IESO, emailing market.registration@ieso.ca, or by contacting the *IESO* Market Registration Specialist assigned to their *equipment change*.

A Register Equipment change is considered to be officially registered when the Equipment Registration Specialist receives a final RAN email from Online IESO verifying that the equipment change is completed and is registered with the *IESO*. A new *facility* cannot participate in the *IESO-administered markets* – nor cause or permit electricity or any *physical service* to be conveyed into, through or out of the *integrated power system* – unless a RAN has been issued by the *IESO*.

3.2.4.1 Interim RANs

Prior to issuing the final RAN, the *IESO* may issue interim RANs that allow certain register equipment change milestones to proceed. For example, for an equipment change involving a new *facility*, an interim RAN may be issued to allow the *facility* to:

- *connect* and energize on potential only;
- *connect* and energize as a *load facility*; or
- *connect* for commissioning purposes.

The *IESO* Market Registration Specialist assigned to the Register Equipment change can provide assistance/guidance on when an interim RAN is needed.

3.2.4.2 RAN Extensions

A RAN may include conditions that are mandatory and must be met by an expiry date. If a condition cannot be met due to circumstances beyond the Participant's control, the Equipment Registration Specialist may request a RAN extension by emailing either their *IESO* Market Registration Specialist or market.registration@ieso.ca, providing the reason for the extension request and a plan for meeting the RAN conditions. If a RAN extension is not granted by the *IESO,* or if the Equipment Registration Specialist does not apply for an extension, the currently issued RAN will expire and will no longer be valid. If a RAN extension is granted by the *IESO*, the RAN version number will increment by one.

3.2.5. Participant and Facility Testing

(Market Rules: Chapter 2, section 6, Appendix 2.2)

For a new or modified *facility*, the *IESO* may conduct tests during the Register Equipment procedure to confirm that the *operational aspects* of the *facility* can interoperate with *IESO* systems and tools. Tests include, but are not limited to:

- confirming capability of transmitting to the *IESO* interface;

- ensuring the connectivity of the *dispatch workstation*;

- confirming that appropriate voice communications are in place;

- if applicable, verifying that the *facility* responds to the *IESO* control signals;

- assessing whether the *facility* complies with all applicable *market rules* and *NERC* and *NPCC reliability standards*; and

- performing (at various Equipment Registration stages described in sections 3.1 through 3.8) data monitoring tests of the required telemetry points with the *IESO* to ensure that statuses, magnitudes, and sign conventions are correct. All anomalies must be fixed and retested before the first energization of the *facility*.

Tests are scheduled as mutually agreed between the *IESO* and the Participant. In order to complete the Register Equipment procedures, all Participant and *facility* tests must be verified and approved by the *IESO*.

> **Important**: Participants are responsible for ensuring that their staff receive appropriate training for all of the testing activities conducted by the *IESO* to ensure that they are able to interoperate with all applicable *IESO* systems. Participants shall have the appropriate employee training and procedures in place to ensure they are prepared for participation in the *IESO-administered markets* as soon as they are authorized.

3.2.5.1 Participant Workstation Testing

Transactions involving data exchanged with *IESO* systems are processed through the *participant workstation* via Online IESO, except for the transfer of real-time data, which is done through the *dispatch workstation* (refer to section 3.2.5.2). *Market participants* are required to install the necessary hardware and software infrastructure in accordance with the technical requirements contained in section 2 of Market Manual 6: Participant Technical Reference Manual (PTRM).

Market participants are required to test and confirm that their *participant workstation* is functional and can interoperate and meet *IESO* technical requirements for non-real time data transfers. *Market participants* receive **Assign Contact Role(s)** and **Confirm System Access Role(s)** tasks from Online IESO, for which they self-confirm. Completion of these tasks, along with the rest of the Equipment Registration procedures through Online IESO is usually sufficient to prove that the *participant workstation* can interact with Online IESO and the *IESO* portal.

3.2.5.2 Dispatch Workstation Testing

Real-time data transactions are processed through the *market participant's dispatch workstation*. *Market participants* with one or more *resources* that respond to *dispatch instructions* must install, test and maintain *dispatch workstations* that meet the requirements in the *participant technical reference manual* for real-time data transfers. The technical requirements for the *dispatch workstation* are contained in Market Manual 6: Participant Technical Reference Manual, section 3.

Testing of the *dispatch workstation* is conducted in the *IESO* Sandbox. *IESO* Information & Technology Services issues test dispatch instructions for which *market participants* are required to respond. The combined time required to set up the Sandbox test and to complete the actual test is approximately one month.

3.2.5.3   Data Monitor Testing

Real-time data (i.e., telemetry point data) is required by the *IESO* to monitor and model the power system and operate the *real-time market*. Market Rule Appendix 4, sections 4.15 through 4.18 specifies the points required and Sections 4.19 through 4.23 indicate the required timing performance. The data link is configured and concurrently, the *IESO* Market Registration Specialist prepares a point list with the *market participant*. The link and points will be added to the *IESO* systems. The *market participant* will have to successfully test the link and points with the *IESO* before the *facility* is approved and a final RAN is issued. Incorrect or incomplete telemetry from a *market participant* shall invalidate the *facility's* approval.

3.3.   Registration Requirements for Generators

(Market Rules: Chapter 7, sections 2.1 and 2.2)

To participate in the *IESO-administered markets*, *market participants* authorized as *generators* are required to register one or more *resources* for each *generation facility*. How g*eneration resources* participate in the *IESO-administered market* varies by the groupings set out in Table 3-3. The *bid/offer* type is a mandatory field that differentiates a registered *generation resource* as either a *dispatchable generation resource*, a *self-scheduling generation resource* or an *intermittent generator*.

The Energy Market Interface uses the *bid/offer* type to identify the *dispatch data* parameters that a *registered market participant* will be eligible to submit for a *resource*.

Table 3-3: Generation Resource Classification by Bid/Offer Type Resource Data Parameter

Bid/Offer Type	Generation Resource Classification
Dispatchable	*Dispatchable* non-quick start *generation resource* (nuclear)
	Dispatchable non-quick start *generation resource* (non-nuclear)
	Variable generation resource
	Dispatchable hydroelectric generation resource
	Dispatchable Quick-start generation resource (other than hydroelectric)
Self-scheduling generator	*Self-scheduling generation resource*
	Transitional generation resource
Intermittent generator	*Intermittent generation resource*

As part of the registration procedures for the *day-ahead market* and *real-time market*, the Equipment Registration Specialist must submit equipment data parameters and *resource* data parameters using Online IESO, as shown in Table 3-4. The *IESO* requires a minimum of two *business days* to implement changes to these values. In addition to the data parameters submitted by the Equipment Registration Specialist, the *IESO* also uses the submitted data to derive additional *resource* data parameters. These parameters are further used to determine the following for a *generation resource*:

- commitments or schedules in the *day-ahead market* and *real-time market*;
- eligibility for *Generator Offer Guarantee* ("GOG"); and
- GOG settlement amounts.

Table 0-4: Resource Data Parameter Requirements, by Generation Resources Classification

Resource Data Parameter	Section – Market Manual 1.5	Mandatory/Optional/by IESO	Generation resource classification								Non-Dispatchable
			Dispatchable								
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facility)	Steam Turbine Resource (combined cycle facility)	Pseudo-unit (combined cycle facility)	Variable Generation	Hydroelectric	Quick start (non-hydroelectric)	Self-scheduling, Transitional and Intermittent
Bid/Offer Type	3.3	M	X	X	X	X		X	X	X	X
Operating Reserve Class	3.3.1	M	X	X	X	X			X	X	
Quick Start Flag	3.3.2	M	X	X	X	X		X	X	X	X
Number of Forbidden Regions	3.3.3.1	O							X		
Start Indication Value	3.3.3.2	O							X		
Hourly Must Run Flag	3.3.3.3	O							X		
Shared Daily Energy Limits	3.3.3.4	O							X		
Time Lag	3.3.3.5	M							X		
Elapsed Time to Dispatch	3.3.4.1	M	X	X	X	X		X	X	X	

Resource Data Parameter	Section – Market Manual 1.5	Mandatory/Optional/by IESO	Generation resource classification								Non-Dispatchable
			Dispatchable								Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facility)	Steam Turbine Resource (combined cycle facility)	Pseudo-unit (combined cycle facility)	Variable Generation	Hydroelectric	Quick start (non-hydroelectric)	Self-scheduling, Transitional and Intermittent
Period of Steady Operation	3.3.4.2	M		X	X	X					
Minimum Loading Point	3.3.4.3	M		X	X						
Minimum Generation Block Run Time	3.3.4.4	M		X	X	X					
Pseudo-Unit Modelling Election Flag	3.3.5.1	O			X	X					
Steam Turbine Minimum Loading Point	3.3.5.2	O					X				
Steam Turbine Percentage Share	3.3.5.3	M					X				
Steam Turbine Duct Firing Capacity	3.3.5.4	by IESO				X					

Resource Data Parameter	Section – Market Manual 1.5	Mandatory/Optional/by IESO	Generation resource classification								Non-Dispatchable
			Dispatchable								Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facility)	Steam Turbine Resource (combined cycle facility)	Pseudo-unit (combined cycle facility)	Variable Generation	Hydroelectric	Quick start (non-hydroelectric)	Self-scheduling, Transitional and Intermittent
Duct Firing 10-Minute Operating Reserve Flag						X					

3.3.1.   Operating Reserve Class

(Market Rules: Chapter 7, section 2.2.8)

The *operating reserve* class indicates which classes, if any, of *operating reserve* the *resource* may provide. The Equipment Registration Specialist submits this mandatory parameter for each *generation resource*.

All *dispatchable generation resources* are eligible to provide *operating reserve* with the exception of *resources* registered with a primary or alternate fuel type of wind or solar photovoltaic. The *IESO* uses this parameter to restrict *offers* submitted by the *registered market participant.*

The Equipment Registration Specialist submits a single value for the parameter by selecting one of the following values in Online IESO:

- **10 min non-spin and 30 min** to indicate election to provide in the non-synchronized *ten-minute operating reserve* and *thirty-minute operating reserve*;
- **30 min non-spin** to indicate election to provide *thirty-minute operating reserve*;
- **All type** to indicate election to provide synchronized and non-synchronized *ten-minute operating reserve* as well as *thirty-minute operating reserve*; or
- **No operating reserve** to indicate election not to provide *operating reserve*.

3.3.2.   Quick Start Flag

The quick start flag indicates if a *resource* is capable of injecting *energy* into the *IESO-controlled grid* within five minutes of receiving a *dispatch instruction* from an offline state. The Equipment Registration Specialist must submit this mandatory parameter for all *dispatchable generation* classifications in **Error! Reference source not found.**. Some *resources* may be associated with *generation facilities* that have unique operating characteristics. As a result, the *IESO* will provide notification for how these *resources* are to be classified. A value for the quick start flag is only registered after the *IESO* approves the submission.

The *IESO* uses this parameter to determine which *generation resources* are *quick start resources* and are eligible to provide *10-minute operating reserve* when their breaker is open. The *settlement process* also uses the value set for this parameter to determine GOG and make-whole payment eligibility.

The *IESO* permits the submission of this data parameter using the following validation rules:

- the value of the *bid/offer* type *resource* data parameter for the *resource* is **Dispatchable**; and
- the value of the quick start flag equipment data parameter for each *generation unit* associated with the *resource* is **Yes**.

If the *resource* is deemed to be a non-quick start *resource* by the *IESO,* the *quick start* flag is N**o**. If the *resource* is deemed to be a *quick start resource* by the *IESO,* the *quick start* flag is recorded as **Yes**. A *resource* with a registered quick-start value of **No** is eligible to provide values

for the *resource* data parameters indicated in [section 3.3.2](#) of this *market manual*. In all cases, the *IESO* also records a start date of the quick-start flag value to handle time dependent revisions that affect *settlement processes*.

3.3.3.   Dispatchable Hydroelectric Generation Resource Registration Requirements

This section applies to a *dispatchable generation resource* associated with one or more *generation units* whose primary fuel type is registered as **Water**. This *resource* is deemed a *dispatchable* hydroelectric *generation resource*. The parameters discussed in this section allow the *IESO* to generate schedules in the *day-ahead market* and *pre-dispatch scheduling* process that respect the technical characteristics of the hydroelectric *generation units* associated with the *resource*. This allows the *dispatch* of these *resources* to respect safety, legislative and environmental considerations.

3.3.3.1   Number of Forbidden Regions

(Market Rules: Chapter 7, sections 2.2.6A.1)

The number of *forbidden regions* parameter represents the predefined operating ranges within which the *generation unit* associated with the *resource* cannot maintain steady operation without causing equipment damage. The Equipment Registration Specialist may submit this optional parameter for its *dispatchable* hydroelectric *generation resource*. This parameter is used by the *IESO* to approve submissions of the forbidden regions *dispatch data* parameter by the *registered market participant* of a *dispatchable* hydroelectric *generation resource* in the *day-ahead market*, *pre-dispatch scheduling* process and *real-time market*.

The Equipment Registration Specialist submits *forbidden regions* into Online IESO by providing the upper and lower limit, as measured in MW, for each *forbidden region*. Registered values for the number of *forbidden regions* meet the following criteria:

- *Forbidden Region* 1 Lower Limit shall be greater than or equal to 0;
- *Forbidden Region* 1 Upper Limit shall be greater than *Forbidden Region* 1 Lower Limit;
- *Forbidden Region* 2 Lower Limit shall be greater than *Forbidden Region* 1 Upper Limit;
- *Forbidden Region* 2 Upper Limit shall be greater than *Forbidden Region* 2 Lower Limit;
- *Forbidden Region* 3 Lower Limit shall be greater than *Forbidden Region* 2 Upper Limit;
- *Forbidden Region* 3 Upper Limit shall be greater than *Forbidden Region* 3 Lower Limit;
- *Forbidden Region* 4 Lower Limit shall be greater than *Forbidden Region* 3 Upper Limit; and
- *Forbidden Region* 4 Upper Limit shall be greater than *Forbidden Region* 3 Lower Limit.
- *Forbidden Region* 5 Lower Limit shall be greater than *Forbidden Region* 4 Upper Limit; and
- *Forbidden Region* 5 Upper Limit shall be greater than *Forbidden Region* 4 Lower Limit.

The *IESO* will review the submitted data and may request additional technical data to support the values submitted. The *IESO* may deny registration of the submitted values if it believes that the technical data does not support the request.

If no values are submitted or approved, then the *IESO* shall assign default values of zero for the number of *forbidden regions* (Chapter 7, section 2.2.6E of the *market rules*).

3.3.3.2   Start Indication Value

(Market Rules: Chapter 7, sections 2.2.6A.2)

The *start indication value* represents the minimum quantity of *energy*, in MW, that one or more *generation units associated with* a *resource* must be scheduled to in the *day-ahead market* and *pre-dispatch scheduling* processes. The Equipment Registration Specialist may submit this optional parameter for each *dispatchable* hydroelectric *generation resource* only.

The *IESO* uses this parameter to determine whether the *generation units* associated with the *resource* have used up one or more of their maximum starts per day. If a *start indication value* is not registered, the *registered market participant* of the associated *resource* will not be permitted to submit the *maximum number of starts per day dispatch data* parameter.

The Equipment Registration Specialist may submit a single value, in MW, for each *generation unit* associated with a *dispatchable* hydroelectric *generation resource*. Submitted values must be greater than 0 MW and less than or equal to the maximum generator *resource* active power capability value registered for the *generation unit*. The Equipment Registration Specialist of a *resource* without a minimum scheduling requirement is not required to submit the *start indication value* equipment data parameter.

3.3.3.3   Hourly Must Run Flag

(Market Rules: Chapter 7, sections 2.2.6A.3)

The *hourly must run* flag indicates if a *dispatchable* hydroelectric *generation resource* is eligible to submit the *hourly must run dispatch data*. Submission of the flag is optional and available only to *dispatchable* hydroelectric *generation resources*. When submitted, the flag must be accompanied by technical data or other applicable supporting documentation that demonstrates the existence of *hourly must run* conditions for each *resource*.

The Equipment Registration Specialist may submit a single value for the *hourly must run* flag into Online IESO. A value of **Yes** indicates that the *registered market participant* for the *resource* intends to submit the *hourly must run dispatch data* parameter in the *day-ahead market* and *pre-dispatch scheduling* processes. The *IESO* will not permit *registered market participants* to submit the *hourly must run dispatch data* parameter if the *hourly must run* flag is registered with a value of **No**. The *IESO* registers the *hourly must run* flag after its review of submitted values and supporting technical documentation.

3.3.3.4   Shared Daily Energy Limits

(Market Rules: Chapter 7, sections 2.2.6A.4)

The *shared daily energy limits* parameter indicates whether one or more *resources* registered by the same *market participant* draw water from the same forebay. The Equipment Registration Specialist submits this optional data parameter for its *dispatchable* hydroelectric *generation resource* in Online IESO.

The *day-ahead market* and the *pre-dispatch scheduling* process use this parameter to verify that all *resources* registered to share this parameter are evaluated such that the sum of their hourly schedules respect *registered market participant* submissions of the maximum daily *energy* limit and minimum daily *energy* limit *dispatch data* parameters.

The Equipment Registration Specialist may submit the shared daily *energy* limit parameter for each *dispatchable* hydroelectric *generation resource* by submitting the Resource ID of all other *resources* that share the same forebay. The maximum daily *energy* limit and minimum daily *energy* limit of the *resource* will then be evaluated with the limits of *resources* that correspond to the Resource IDs submitted. If no value is submitted, the *day-ahead market* and *pre-dispatch scheduling* processes will evaluate the maximum daily *energy* limit and the minimum daily *energy* *dispatch data* on an individual *resource* basis.

3.3.3.5   Time Lag

(Market Rules: Chapter 7, sections 2.2.6H.1)

The *time lag resource* data parameter represents the amount of time, in hours, it takes for the water discharged from an upstream *dispatchable* hydroelectric *generation resource* to reach a downstream *dispatchable* hydroelectric *generation resource* on the same cascade river system. These *generation resources* on the same cascade river system with a registered *time lag* are known as linked *resources*.

This optional parameter may be submitted by the Equipment Registration Specialist of a *dispatchable* hydroelectric *generation resource*. The *IESO* uses this parameter in the *day-ahead market* and *pre-dispatch scheduling* process to approve submissions of the time lag *dispatch data* parameter by the *registered market participant* for the *resource*. Additionally, the *IESO* uses the time lag *resource* data parameter to determine if the *registered market participant* is permitted to submit linked *resources*, time lag and MWh ratio as *dispatch data* in the *day-ahead market* and *pre-dispatch scheduling* process. A *registered market participant* is not permitted to submit these *dispatch data* parameters if a *resource* does not have a registered time lag value.

The Equipment Registration Specialist submits a single value for this *resource* data parameter by submitting a whole number that is greater than or equal to 0 hours and less than 24 hours. The *time lag resource* data parameter can only be submitted by an Equipment Registration Specialist when both the upstream *resource* and downstream *resource* on the same cascade river system have the same *registered market participant*. The *IESO* may request additional technical data or other supporting documentation to support registration of *time lag*. The *IESO* registers the *time lag* after it reviews submitted values and supporting technical documentation.

3.3.4.   Dispatchable Non-Quick Start Generation Resources

This section applies to *dispatchable generation resources* that have a value of **No** for their quick start flag *resource* data parameter and are accordingly classified as a *dispatchable* non-quick start *generation resource*.

Registered market participants have the ability to submit a *start-up offer* and *speed-no-load offer* as hourly *dispatch data* into the *day-ahead market* and *pre-dispatch scheduling* process. *Registered market participants* submitting such *dispatch data* may do so only for:

1. a *dispatchable* non-quick start *generation resource* associated with a *generation unit* that has a primary or alternate fuel type value other than **Uranium**
2. a *pseudo-unit*.

The Equipment Registration Specialist for a *market participant* that intends to submit *start-up offers* and *speed-no-load offers* as *dispatch data* must submit a declaration of intent to submit these *offers* through Online IESO. The Equipment Registration Specialist will be provided with instructions to use the *offer* template file version with the according *start-up offer* and *speed no-load offer* parameters. Changes to the *start-up offer* and *speed no-load offer* declaration must be communicated via Online IESO.

Resource data parameters specific to the modelling of a *dispatchable* non-quick start *generation resource* are described in the subsections below. A *dispatchable* non-quick start *generation resource* that has indicated an alternate fuel source as **Steam** and a primary or secondary fuel type that is not **Uranium** is deemed as a combined cycle *generation resource* and subject to registration of the *resource* data parameters indicated in [section 3.3.5](#) of this *market manual*.

3.3.4.1   Elapsed Time to Dispatch

(Market Rules: Chapter 7, section 2.2.6K)

The elapsed time to dispatch parameter represents the minimum amount of time, in minutes, between the time in which the start-up sequence is initiated for all *generation units* associated with a *dispatchable* non-quick start *generation resource* and the time in which the *resource* becomes *dispatchable* by reaching its MLP. The Equipment Registration Specialist submits this data parameter for its *dispatchable* non-quick start *generation resources*.

The *IESO* uses the *elapsed time to dispatch* data parameter to determine whether the *generation resource* qualifies for GOG status. The *IESO* approves this data parameter in accordance with the Elapsed Time to Dispatch supporting document as described in the [Register Equipment Help File](#).

The Equipment Registration Specialist submits a single value for this *resource* data parameter by submitting the number of minutes as a numeral. The *IESO* registers *elapsed time to dispatch* after its reviews submitted values and supporting technical documentation.

3.3.4.2   Period of Steady Operation

(Market Rules: Chapter 7, section 2.2.6H.2)

The *period of steady operation resource* data parameter represents the number of *dispatch intervals* for which one or more *generation units* of a *dispatchable* non-quick start *generation resource* must maintain steady operation before changing direction of its *energy* output (either increasing or decreasing). Submission of this data parameter by the Equipment Registration Specialist in Online IESO is mandatory only for a *resource* registered as a *dispatchable* non-quick start *generation resource*.

Period of steady operation is used in the *real-time market* to maintain the direction of a *resource*'s *dispatch instruction* for a minimum number of *dispatch intervals*. The Equipment Registration Specialist submits the data parameter, by providing a value of 0, 1 or 2 to reflect the number of *dispatch intervals.* The *IESO* will assign a default value of 0 if no value is submitted by the Equipment Registration Specialist.

Depending upon the value submitted, it may be necessary for the *IESO* to adjust the *period of steady operation* value if there is a negative impact on overall system operation. The *market participant* will be notified through Online IESO of any changes to this value.

3.3.4.3   Minimum Loading Point

(Market Rules: Chapter 7, section 2.2.6B)

The *minimum loading point* ("MLP") reflects the level of output, in MW, where one or more *generation units* associated with the *resource* is stable without ignition support while meeting the emissions performance standards set forth by legislation.

The Equipment Registration Specialist submits this parameter for each *dispatchable* non-quick start *generation resource* that does not have a registered primary or alternate fuel type of **Uranium**. The *IESO* uses the MLP registration parameter to approve the MLP submitted as *daily dispatch data* by the *registered market participant*. The *IESO* also uses the registered MLP to determine the GOG eligibility for a *resource*.

The Equipment Registration Specialist submits a single MLP for each eligible *resource* by providing a value in MW. Supporting technical documentation that demonstrates the MLP for each *resource* must also be provided. The value ~~registered~~ submitted must be greater than zero and less than or equal to the value of the maximum active power capability registered as equipment data for the *generation unit* corresponding to the *resource*. The *IESO* shall assign a default value of 0 MW if a value is not submitted by the Equipment Registration Specialist. The *IESO* registers the MLP after its review of submitted values and supporting technical documentation.

If a *resource* is part of a combined cycle *generation resource* and associated with a *generation unit* that has an alternate fuel type of **Steam**, referred to as a steam turbine, the Equipment Registration Specialist may submit multiple values for the MLP*.* Submission of the MLP for a steam turbine is described in section 3.3.5.2 of this market manual.

3.3.4.4   Minimum Generation Block Run Time

(Market Rules: Chapter 7, section 2.2.6B)

The *minimum generation block run time* ("MGBRT") is the number of hours that a *generation unit* associated with a *resource* must operate at, or above, the MLP. The Equipment Registration Specialist submits the *minimum generation block run time resource* data parameter for a *dispatchable* non-quick start *generation resource* associated with a *generation unit* that does not have a primary or alternate fuel type registered as **Uranium**. The *IESO* uses the *minimum generation block run time resource* data parameter to determine the *resource's* eligibility for GOG status.

The Equipment Registration Specialist submits a single value of the *minimum generation block run time* for each eligible *dispatchable* non-quick start *generation resource* by providing a value from 0 to 24 hours. The *IESO* approves submissions by using supporting technical documentation submitted by the Equipment Registration Specialist in Online IESO. The *IESO* registers MGBRT after its review of submitted values and supporting technical documentation.

3.3.5.   Combined Cycle Facility

(Market Rules: Chapter 7, sections 2.2.6G)

A combined cycle *facility* is a *generation facility* that contains at least one *dispatchable* non-quick start *generation resource* registered with a generator turbine type value of combustion turbine and at least one *dispatchable* non-quick start *generation resource* registered with a generator turbine type value of steam turbine. The generator turbine type is a mandatory *resource* data parameter that the *IESO* specifies for a *resource* based on the equipment data parameters submitted by the Equipment Registration Specialist for each *generation unit* associated with the *resource*. The *resource* registered with the combustion turbine value is deemed as a combustion turbine *resource*. The *resource* registered with the steam turbine value is deemed as a steam turbine *resource*.

Modelling of a combined cycle *facility* in the *day-ahead market* and *real-time market* allows *generators* to offer their dependent units into the market as one *pseudo-unit*, reflecting actual operation dependencies for each combustion turbine with the associated portion of the steam turbine capacity.

This section applies to a combined cycle *facility* whose *generation units* are represented by individual *resources* and do not have physically aggregated *resources*. Aggregation is explained in section 3.6 of this *market manual*.

In addition to any applicable registration requirements in the Register Equipment Help File, the Equipment Registration Specialist is required by Chapter 7, section 2.2.6G of the *market rules* to submit all mandatory *resource* data parameters specific to a combined cycle *facility* as listed in this subsection. Registration of this data allows a *market participant* that intends to utilize a *pseudo-unit* to schedule their combined cycle *facility* in the *day-ahead market* and *real-time market*.

To deregister *pseudo-units* , the *market participant* must submit a written request to the *IESO*, at market.registration@ieso.ca. Deregistration must include all of the *pseudo-units* at the *facility*

(i.e., all of the *pseudo-units* associated with the combustion turbines that share the same steam turbine). For *facility* deregistration procedures, refer to section 5.1.

3.3.5.1 Combustion and Steam Turbine Configuration Relationships – Pseudo-Unit Modeling

Potential *dispatch* configuration relationships between combustion turbine *resources* and a steam turbine *resource* at a combined cycle *facility* must be established. These relationships will help ensure that steam turbine *resource* constraints, as a result of a commitment in the *day-ahead market, pre-dispatch scheduling* process or *real-time market*, are applied to the correct MLP amount based on the steam turbine *resource's* schedule, and the scheduled configuration of associated combustion turbine *resources*.

For registration purposes, the Equipment Registration Specialist must provide the Resource Name and Resource ID of up to four physical combustion turbine *resources* and one physical steam turbine *resource*, which make up the combined cycle *facility*. The Resource Name and Resource ID are assigned by the *IESO* for each combustion turbine *resource* and steam turbine *resource* and are available in Online IESO. From this submission, the *IESO* derives relationships between the combustion turbine *resources* and the steam turbine *resources* and records their associations.

For participation in *pseudo-unit* modeling, *pseudo-units* are created and their relationship to a combustion turbine *resource* and steam turbine *resource* is recorded. The *pseudo-unit* modelling election flag *resource* data parameter is assigned by the *IESO* to each combustion turbine *resource* and steam turbine to indicate that the *market participant* has elected to enable *pseudo-unit* modelling for scheduling. The number of *pseudo-units* to be registered is equal to the number of combustion turbine *resources* at the combined cycle *facility* (refer to Figure 3-2).

Combined cycle relationship data for a combined cycle *facility* participating in *pseudo-unit* modeling are used to:

- calculate *pseudo-unit dispatch data* values from physical unit submissions;
- allocate physical unit derating and transmission limitations to the *pseudo-unit* level;
- translate the *pseudo-unit* schedules to physical unit level; and
- enable GOG *settlement* of *pseudo-unit* s on the physical unit level.

The *IESO* approves the data for all physical combustion turbine *resources* and steam turbine *resources* based on the following rules:

- each *resource* has been registered individually;
- each *resource* is part of the same *facility;*
- each *resource* has a *resource bid* type of **Dispatchable**;
- the *resources* are not part of an aggregated *resource*;
- all *resources* are under the operational control of a single *market participant*; and
- all resources are assessed a settlement under a single metered market participant.

For participation in *pseudo-unit* modeling as part of scheduling of the combined cycle *facility* in the *day-ahead market* and *real-time market*, further validation by the *IESO* includes:

- the number of *pseudo-units* registered is equal to the number of combustion turbine *resource*s registered to the combined cycle *facility*;

- each *pseudo-unit* will have a unique combustion turbine *resource*;

- all combustion turbine *resources* at a combined cycle *facility* that register as a *pseudo-unit* must share the same steam turbine *resource*;

- GOG eligibility for each *pseudo-unit resource* will be based on the physical combustion turbine *resource* unit technical data;

- *pseudo-unit* market type participation (i.e., *energy market*, *operating reserve market*) shall be identical to that of the physical combustion turbine *resource* unit registration data;

- *pseudo-unit* administrative relationships (i.e., *registered market participant*, *metered market participant*, as well as *registered market participant* user eligibility to submit *dispatch data*) shall be identical to that of the physical combustion turbine *resource* unit technical data;

- *pseudo-unit* maximum generator capacity (PSU MGC) will be calculated and recorded based on the MGC of the combustion turbine *resource* (CT) and steam turbine *resource* (ST), and the parameter registered in [section 3.3.5.3](#). Computed parameters need to be rounded to the nearest single decimal value in the following formula:
  PSU MGC = (ST Share% * ST MGC) + CT MGC; and

- *pseudo-unit* maximum ramp rate will be calculated and recorded based on the sum of the Maximum Ramp Rate of the combustion turbine *resource* and steam turbine *resource*.

The combined cycle *facility* relationships and *resource* data parameter requirements are summarized in Figure 3-2.
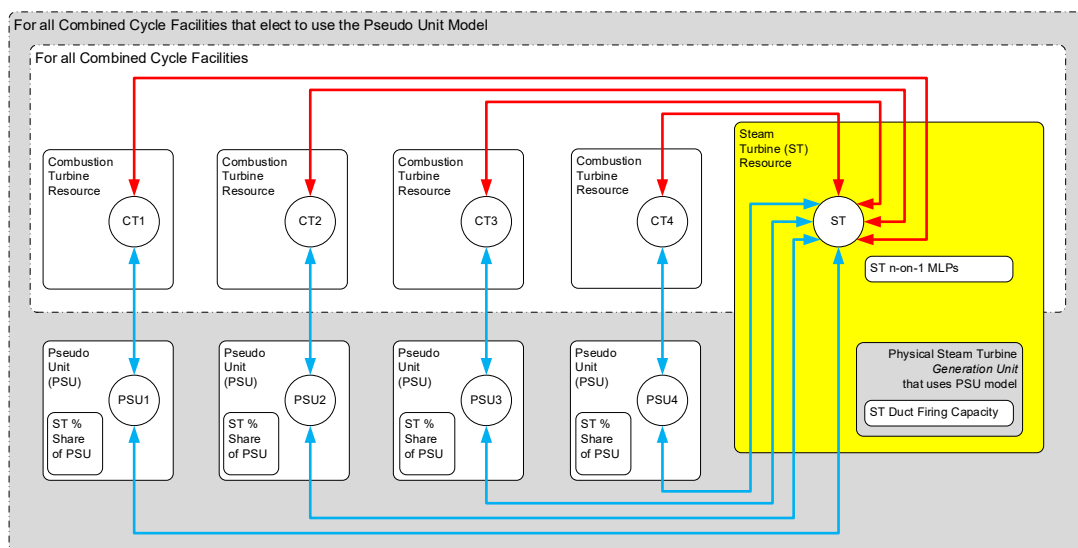
Legend: Combined cycle facilities require all "**red line**" relationships shown to be established.
            Combined cycle facilities that elect to use the pseudo unit model require all "**red line**" and "**blue line**" relationships shown to be established.

Figure 3-2: Combined Cycle Facility Relationships and Resource Data Parameter Requirements

3.3.5.2   Steam Turbine Minimum Loading Point

The steam turbine MLP reflects one or more *resource* data parameters for a steam turbine *resource*. It is the MLP, in MW, that is required for a steam turbine *resource*, given its relationship with one or more combustion turbine *resources*. The number of steam turbine MLPs that must be registered corresponds to the number of combustion turbine *resources* at the same combined cycle *facility* that share a steam turbine *resource* (Figure 3-3). The *IESO* uses the steam turbine MLP *resource* data parameters to accept daily *dispatch data* submissions of steam turbine *resource* MLPs. The Equipment Registration Specialist must submit one or more of the following *resource* data parameters:

- steam turbine MLP – when 1 or more combustion turbines associated with the steam turbine;
- steam turbine MLP (2 on 1) – when 2 or more combustion turbines are associated with the steam turbine;
- steam turbine MLP (3 on 1) – when 3 or more in-service combustion turbines are associated with the steam turbine;
- steam turbine MLP (4 on 1) – when 4 or more in-service combustion turbines are associated with the steam turbine.

The value submitted by the Equipment Registration Specialist for the steam turbine must reflect the actual capability of the associated *generation unit*.

- The *IESO* accepts the submission using the following validation rules:
- must be a steam turbine part of a combined cycle *facility;*
- number format xxxx.x – unit is MW; and
- $0 < \text{MLP}(i\text{-}1)\text{-on-}1 < \text{MLP}(i)\text{-on-}1 =< \text{MGC}$,
- where:
  - MLP
    - is the minimum loading point.
  - MGC
    - is the *pseudo-unit* maximum generator capacity as determined by the *IESO*
  - i
    - is an index for the steam turbine MLP to indicate its relationship to the CCP configuration. The "i" is defined as a variable $2 =< i =< n$, where "n" is the number of combustion turbines at the combined cycle *facility*.

3.3.5.3   Steam Turbine Percentage Share

The steam turbine percentage share is the amount of steam turbine capacity associated with each *pseudo-unit*, expressed as a percentage. This data parameter must be submitted by the Equipment Registration Specialist for each *pseudo-unit*. The *IESO* uses this parameter to

determine the steam duct firing capacity of a *pseudo-unit* and the maximum generator resource active power capability equipment data parameter for the *generation unit* associated with the steam turbine.

The Equipment Registration Specialist must submit a percentage, from 0% to 100%, that correlates to the number of combustion turbines registered for the combined cycle *generation facility*.

The *IESO* accepts the submission using the following validation rules:

- the number of steam turbine percentage share values registered must equal the number of registered combustion turbines elected for *pseudo-unit* modeling;
- each steam turbine percentage share value must >=0 and in the format xx.x %;
- the sum of all steam turbine percentage share values = 100.0%; and
- each steam turbine percentage share value * (registered maximum generator resource active power capability for the steam turbine *generation unit* associated with the steam turbine) >= (MLP for a 1 combustion turbine to 1 steam turbine relationship).

3.3.5.4   Steam Turbine Duct Firing Capacity

The steam turbine duct firing capacity represents the capacity, in MW, available from the duct firing range of the *generation unit* associated with a steam turbine *resource*. This data parameter may be submitted by the Equipment Registration Specialist for each *generation unit* associated with a steam turbine *resource* and reflects the actual capability of the *generation unit.* If the *market participant* has elected to model the steam turbine *resource* as part of a *pseudo-unit,* the *IESO* will use this parameter to derive the steam turbine duct firing capacity parameter for the associated *resource*. The *resource's* data parameter is used to calculate the duct firing operating region when scheduling a *pseudo-unit* in the *day-ahead market*, *pre-dispatch scheduling* process and *real-time market*.

The *IESO* accepts the submission using the following validation rules:

- the *generation unit* must be associated with a steam turbine that is part of a combined cycle *facility*;
- number format xxxx.x – unit is MW; and
- 0 =< Duct Firing =< ST MGC – [(Registered Number of Combustion Turbines at a Combined Cycle Plant) * (Registered ST MLP1-on-1)]

3.3.5.5   Duct Firing 10-Minute Operating Reserve Capability Flag

The *duct firing 10-minute operating reserve capability* flag indicates the ability of a steam turbine *resource* associated with a pseudo-unit to initiate duct firing in order to provide 10-minute synchronized or 10-minute non-synchronized *operating reserve*. This parameter can be used to prevent steam turbine *resources* associated with a *pseudo-unit* from receiving 10-minute *operating reserve* schedules within the duct firing operating region. The *IESO* uses this parameter to determine which classes of *operating reserve* can be scheduled in the duct-firing region of a

pseudo-unit. The parmaeter is only used if the steam turbine *resource* is registered to participate in *pseudo-unit* modelling and is scheduled as part of a *pseudo-unit* in the *IESO-administered markets*.

This data parameter must be submitted by the Equipment Registration Specialist for each steam turbine *resource* that has elected to participate in *pseudo-unit* modelling. The value submitted by the Equipment Registration Specialist must reflect the actual capability of all *generation units* associated with steam turbine *resources* in a *pseudo-unit*. A value of **No** indicates the *pseudo-unit* may not be scheduled by the *IESO* for 10-minute synchronized or 10-minute non-synchronized *operating reserve* in the duct firing region. A value of **Yes** indicates that the *pseudo-unit* may be scheduled by the *IESO* for any class of *operating reserve* in the duct firing region.

3.4.   Requirements for Generator Offer Guarantee Status

The GOG status represents whether a *resource* registered as a *dispatchable* non-quick start *generation resource* (including those at a combined cycle *facility*) or *pseudo-unit* is eligible for GOG payments when the *day-ahead market* or *pre-dispatch scheduling* process commits the *resource*.

A *resource* is eligible for the GOG status if they register the following information for their *dispatchable* non-quick start *generation resource*:

- an *elapsed time to dispatch* greater than sixty minutes;
- an MLP greater than zero;
- a *minimum generation block run-time* greater than sixty minutes; and
- a primary or secondary fuel type that is not **Uranium**.

The Equipment Registration Specialist for an eligible *resource* must submit the GOG election flag *resource* data parameter to request the GOG status in the *day-ahead market* and *real-time market*.

Upon receipt, the *IESO* processes GOG status requests by reviewing the data. The *IESO* may request additional technical data to support the values submitted. The *IESO* may deny registration of the submitted values if it believes that the technical data does not support the request. If approved, the *IESO* assigns the GOG *resource* data parameter to all eligible *resources*.

3.5.   Registration Requirements for Wholesale Consumers

(Market Rules: Chapter 7, sections 2.1, 2.2.1, 2.2.2, 2.2.3, 2.2.5, 2.2.6 as applicable, 2.2.8)

Wholesale consumers may participate in the *IESO-administered markets* using a *load resource* with one of the classifications specified in Table 3-5. These classifications are determined by the

bid/offer type as established by the *bid/offer* type *resource* parameter. This parameter must be submitted by each *load resource* and is described in the subsection below.

Table 3-5: Classification for Load Resources

Bid/Offer Type	Load Resource Classification
Dispatchable	*Dispatchable load*
Non-dispatchable	*Non-dispatchable load* *Hourly demand response resource*
Day-Ahead price responsive	*Price responsive load*

There are specific registration requirements for the various types of *resources* participating in the *day-ahead market* and *real-time market*. These requirements are outlined in Table 3-6 and are used by the *IESO* tools and processes to support *dispatch data* validation, scheduling and *dispatch* decisions and *settlement*.

Table 3-6: Load Resource Registration Parameters

Registration Parameter	Mandatory/ Optional	Load Resource Classification			
		Non-Dispatchable Load	Dispatchable Load	Price Responsive Load	Hourly Demand Response
Bid/Offer Type	M	X	X	X	X
Operating Reserve Class	M		X		
Maximum Registered Dispatchable or Price Responsive Load capacity	by *IESO*		X	X	

As part of the registration procedures for the *day-ahead market* and *real-time market*, the Equipment Registration Specialist must submit specific technical data and *resource* data through Online IESO, which the *IESO* uses to determine a *resource's*:

- commitments and schedules, while respecting the *facility's* technical data; and
- make-whole payment eligibility for the *day-ahead market* and *real-time market*.

The following subsections describe the applicable *resource* data parameters that must be submitted by the Equipment Registration Specialist of a *load facility*.

3.5.1. Bid/Offer Type

The *bid/offer* type registration parameter is a mandatory registration parameter for all *load resources*. This parameter identifies a *resource* registered as either a *dispatchable load, price responsive load* or a *non-dispatchable load*. The value selected by the Equipment Registration Specialist will be used by the *IESO's* tools to determine *bid* submission eligibility for a *load resource* in the *day-ahead market* and *real-time market.* During the registration procedure, the Equipment Registration Specialist must select one of the following *bid/offer* types for each *load resource* during the registration procedure:

- **Dispatchable** to indicate a *market participant*'s intent to participate in the *IESO-administered markets* as a *dispatchable load;*
- **Day-ahead price responsive** to indicate a *market participant*'s intent to participate in the *IESO-administered markets* as a *price responsive load*; or
- **Non-dispatchable** to indicate a *market participant*'s intent to participate in the *IESO-administered markets* as a *non-dispatchable load*.

Market participants can 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 4.2.2 in this manual.

3.5.2. Operating Reserve

(Market Rules: Chapter 7, sections 2.2.8)

Each *wholesale consumer* associated with a *dispatchable load* must submit a value for the *operating reserve* class registration parameter*.* This parameter identifies if the *resource* is eligible to provide *operating reserve* and the *operating reserve* classes that the *market participant* has elected to provide. Eligibility criteria for participation in the *operating reserve markets* by a *dispatchable load* are described in section 3.5.2.1 of this *market manual*.

The Equipment Registration Specialist of a *dispatchable load* eligible to provide *operating reserve* may submit one of the following values in Online IESO:

- **10 min non-spin and 30 min** to indicate election to provide in the non-synchronized *ten-minute operating reserve* and *thirty-minute operating reserve*;
- **30 min non-spin** to indicate election to provide *thirty-minute operating reserve*;
- **All type** to indicate election to provide synchronized and non-synchronized *ten-minute operating reserve* as well as *thirty-minute operating reserve*; or
- **No operating reserve** to indicate election not to provide *operating reserve*.

3.5.2.1 Eligibility Criteria for Participation in the Operating Reserve Markets

Dispatchable loads must have a predictable, periodic consumption cycle, and meet the eligibility criteria for participation in the *ten-minute* and *thirty-minute operating reserve* market as described in Table 3-7.

Table 3-7: Dispatchable Load Eligibility Criteria

	Criteria	Rationale
1	Must demonstrate a load cycle of more than 0.75 (total minutes consuming divided by total minutes of the cycle period)	This criterion allows the *IESO* to make assumptions about the availability and consumption level of the *load resource*. A lower duty ratio means that the *IESO* has to carry more *ten-minute or thirty-minute operating reserve* or *regulation* to compensate for a higher uncertainty of the ability of the *load resource* to comply with the *ten-minute* or *thirty-minute operating reserve* activation request. This also limits the exposure of that *load resource* in the event it's scheduled for *ten-minute or thirty-minute operating reserve* but is not able to activate because it would be down 10 or 30 minutes after receipt of the activation message. For instance, for *ten-minute non-spinning operating reserve*, if a *load resource* was down six minutes then up four minutes, it would meet criterion #2, but have a duty cycle of 40%. However, if it were activated in minute 3, then ten minutes later (i.e., minute 13) it would have been down anyway. Criterion #2 combined with criterion #4 limits this exposure.
2	Must not be at zero consumption for more than 10 minutes at a time (exceptions are allowed for unplanned events)	This criterion is required to help ensure that the *load resource* will be able to respond to a *ten-minute operating reserve* activation and reduce consumption within 10 minutes (i.e., the *resource* would have been loaded at the time the relief is required).
3	Must not be at zero consumption for more than 30 minutes at a time (exceptions are allowed for unplanned events)	This criterion is required to help ensure that the *load resource* will be able to respond to a *thirty-minute operating reserve* activation and reduce consumption within 30 minutes (i.e., the *resource* would have been loaded at the time the relief is required).
4	Must be able to maintain a zero consumption level for at least one hour, when activated for *10-minute* or *30-minute operating reserve*	A*s* described in *NPCC* Directory 5 Reserve.
5	Must be able to respond to the *IESO's* activation request for *10-minute reserve* and reduce load within 10 minutes	A*s* described in: • *IESO market rules*, definitions of 10-minute and 30-minute reserve • *NERC* Glossary of Terms

	Criteria	Rationale
6	Must be able to respond to the *IESO*'s activation request for *30-minute reserve* and reduce load within 30 minutes	As described in: • *IESO market rules*, definitions of 10-minute and 30-minute reserve • *NERC* Glossary of Terms

3.5.2.2 Batch Type Dispatchable Loads

Most of the *dispatchable loads* participating in the *energy market* are of the continuous process type. However, some *loads* are batch type loads, meaning that there are cyclical periods during the *bidding* hour in which they are operating at 0 MW in order to refuel or unload.

Batch type *loads* may be considered for participation in the *energy market* as *dispatchable loads* provided:

- the batch type *load* has an hourly consumption schedule that is predictable at least two hours in advance of the *dispatch hour* to allow the *market participant* to formulate and submit its *offers* within the timelines specified by the *market rules* for *dispatchable facilities;* and

- the batch type *load* exhibits a duty ratio of at least 0.75. This means that within an hour, the *load* should not be at zero consumption for more than a cumulative of 15 minutes.

3.5.3.   Maximum Registered Dispatchable or Price Responsive Load

The maximum registered *dispatchable* or *price responsive load* registration parameter is a mandatory *resource* data parameter that is determined by the *IESO*. This parameter represents the maximum active power capability for a *resource* registered as either a *dispatchable load* or *price responsive load*. For a *dispatchable load*, the *IESO* uses this parameter to calculate the maximum *offer* quantity for *energy* or *operating reserve* that can be submitted as *dispatch data*. For a *price responsive load*, the *IESO* uses this parameter to calculate the maximum *offer* quantity for *energy* that can be submitted as *dispatch data* in the *day-ahead market*. The *IESO* determines the value of this parameter by calculating the sum of the values provided by the Equipment Registration Specialist for all registered *loads* associated with the *load resource*.

3.6.   Aggregation

(Market Rules: Chapter 7, sections 2.3)

At or subsequent to their initial registration, *market participants* may apply to aggregate *generation units* or *loads* for the purpose of submitting *bids/offers*. As per Chapter 7, section 2.3 of the *market rules*, aggregated *resources* will be treated by the *IESO* as a single *resource*. The *IESO* will only grant an aggregation request from a *market participant* if the aggregation will not affect *system operating limits*, and will not affect *security* or *resource adequacy* assessments.

3.6.1. Resource Compliance Aggregation

Resources that are not eligible for aggregation may be eligible for compliance aggregation. This is where individual *generation resources* within a defined group may ignore their *dispatch* provided that the total *dispatch* is respected. For example, two generators G1 and G2 each have a *dispatch* of 5 MW. Under compliance aggregation, G1 may generate 3 MW and G2 7 MW, meeting the total *dispatch* of 10 MW. This is typically for river systems whose *generation facilities* do not share common *connection points* (hence ineligible for aggregation), but may individually suffer challenges in following *dispatch instructions* due to sharing a single fuel supply.

Market participants who wish to participate in compliance aggregation shall submit a request noting the relationships between these *resources* (e.g., river system).

The request for aggregation will be considered based on:

- whether the resources to be aggregated are dispatchable quick-start generation facilities or dispatchable non-quick-start generation facilities. Where a market participant wishes to register dispatchable non quick-start generation facilities, such resources will be subject to ramp rate restrictions when exercising compliance aggregation in real time. These restrictions are outlined in Market Manual 4: Market Operations Part 4.3: Real-Time Scheduling of the Physical Markets, section 1.12;

- whether the *resources* are related to each other (e.g., river systems); and

- the likelihood that the *resource* will be sent to Unit Specific Dispatch for *security* reasons.

If the request for aggregation is approved, the *market participant* will be notified. The in-service activities of the aggregated *resources* are coordinated by the *IESO* in the same way as for any new or modified *facility*.

3.7. Variable Generation Facility Registration

(Market Rules: Chapter 4, section 7.1.6)

Each *variable generator* having a wind or solar photovoltaic *generation facility* with an installed capacity of 5 MW or greater, and each wind or solar photovoltaic *facility* that is directly *connected* to the *IESO-controlled grid* is required to:

- authorize as a program participant for centralized forecasting service (refer to section 2.3.2);

- register via Online IESO to provide operational and meteorological monitoring data for centralized forecasting service, then (after being registered) provide the data via Online IESO (refer to sections 3.7.1 through 3.7.4);

- submit *facility* data for its equipment and supporting documentation for its meteorological equipment via Online IESO. Refer to Appendix C (wind) and Appendix D (solar) for complete listings of the required *facility* data. Submitted data are reviewed and (if the data meet requirements) approved by the *IESO*; and

- coordinate with the *IESO* for scheduling and performing data monitoring (operational and meteorological) tests.

3.7.1.   Operational and Meteorological Monitoring

As a *market participant*, a *variable generator*[20] must provide operational telemetry to the *IESO* and is subject to the operational monitoring requirements outlined in *market rules* Appendix 4.15 and to the performance requirements outlined in *market rules* Appendix 4.19. These requirements are based on a per *facility* basis. All operational monitoring shall be provided to the *IESO* as per the specifications defined in Market Manual 6: Participant Technical Reference Manual, section 4.

Meteorological monitoring that measures local weather at the *facility* shall be provided to the *IESO* at least once every 30 seconds and shall not be modified in any way (i.e., the provided value is not an averaged value).

3.7.2.   Meteorological Monitoring - Wind Generation Facilities

At the time of registration, the *IESO* will provide the Equipment Registration Specialist with a list of applicable operational monitoring based on the requirements listed in Appendix C (wind).

Each wind turbine must be no further than 5 km from the nearest meteorological data collection point. A wind *generation facility* may collect and send meteorological data from as many points at the *facility* as are available.

Data are collected through the use of meteorological towers, sodar or lidar technology, nacelle mounted equipment, or a combination of these methods[21]. However, the minimum number of meteorological towers or sodar/lidar units per *facility* must be met, as per Table 3-8, prior to considering any other technology (i.e., nacelle mounted equipment). Multiple *facilities* can provide data from the same data collection points if they are within the 5 km range.

3.7.3.   Meteorological Towers and Sodar/Lidar Technology

Wind *facilities* shall provide operational monitoring that measures local weather from standalone meteorological towers, or sodar or lidar units, located in areas representative of the microclimate and winds on the prevailing upstream side of the wind *facility*. Data that must be provided by a wind *facility* is found in Appendix C.

If a wind *facility* provides weather data using sodar or lidar technology, supplementary nacelle mounted wind speed and direction data shall be provided. Meteorological monitoring using nacelle mounted equipment shall comply with the requirements as stated in Table C-4 of Appendix C.

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[20] As per *Market Rules* Appendix 4.19, the *IESO* considers medium performance to be acceptable for embedded *variable generators* (i.e., program participants).

[21] As alternative technologies are identified, the *IESO* will review their compatibility with the existing requirements and where appropriate expand the list of acceptable technologies.

Table 3-8: Meteorological Tower or Sodar/Lidar Unit Requirements for Wind Facilities

Facility Size	Total Number of Meteorological Towers or Sodar/Lidar Units per Facility
Less than 10 MW	None
10 MW to less than 100 MW	1 minimum
100 MW to less than 200 MW	2 minimum
200 MW to less than 300 MW	3 minimum
300 MW to less than 400 MW	4 minimum

3.7.4.   Operational Monitoring - Solar Generation Facilities

At the time of registration, the *IESO* will provide the Equipment Registration Specialist with a list of applicable monitoring based on the requirements in Appendix D (solar).

Each solar *facility* shall have a minimum of two meteorological data collection points irrespective of the physical size of the solar *facility*. No solar panel shall be further than 12 km from the nearest two meteorological data collection points. Multiple *facilities* can provide data from the same data collection points if they are within the 12 km range.

3.8.   Next Steps

After the Stage 5: Register Equipment procedure is complete, the next stage in connecting to Ontario's power system is Stage 6: Commission equipment and validate performance. Stage 6 is not always mandatory. This procedure is outlined in the Commission equipment and validate performance process diagram.

3.8.1.   Commission Equipment

(Market Rules: Chapter 7, sections 2.2A)

During the Commission Equipment stage, the *market participant* conducts commissioning tests of the equipment installed at their *facility.* These tests are scheduled according to the procedures in Market Manual 7: System Operations Part 7.3: Outage Management.

The purpose of the commissioning tests is to confirm whether the equipment:

- meets the requirements and expectations established during the *connection assessment* process and defined in the Notice of Conditional Approval to Connect;
- is impactive on the *reliability* of the *IESO-controlled grid*; and
- should be included in the *outage* reporting requirement.

All exclusions from the outage reporting requirement are subject to periodic review by the *IESO* and may be revoked at any time as a result of such a review and/or changes to *facilities*.

Commission testing consists of the following four steps, which are described in detail on the Stage 6: Commission equipment and validate performance webpage:

1. submit commissioning request;

2. submit commissioning test plan;

3. complete commissioning test; and

4. submit commissioning test report.

3.8.2.   Performance Validation

The primary purpose of performance validation is to mitigate risks that equipment will not be suitable for connection to the *IESO-controlled grid*. Performance validation applies to new equipment and to equipment that has been modified such that it causes a change to its performance characteristics.

During the Register Equipment procedure, the Equipment Registration Specialist will receive notification from Online IESO if performance validation is required. For more information, refer to Market Manual 1: Connecting to Ontario's Power System Part 1.6: Performance Validation.

– End of Section –

4.   Maintain IESO Registered Data

The purpose of the Maintain IESO Registered Data procedures is to maintain data such that the *IESO* retains current and accurate information on Participants and service providers. This includes maintaining data related to their applicable *facilities*, equipment, *resources*, and people and their contact information and system accesses registered with the *IESO*.

Changes to registered data should be identified to the *IESO* and made in Online IESO as soon as possible before they take effect. However, some proposed changes must be identified to the *IESO* well before they take effect.

Important: It is the responsibility of the Participant or service provider to review and maintain their *IESO* registered data and submitted supporting documentation on an enduring basis, to ensure that they all are correct.

4.1.   Maintain Organization/Participant Registered Data

(Market Rules: Chapter 1, section 11.3.1; Chapter 2, section 3.1.8)

Each Participant and service provider, via their Applicant Representatives, is required to maintain *IESO* registered data, including supporting documentation, by reviewing and updating them as necessary in Online IESO. Examples of *IESO* registered data include (but are not limited to):

- organization name, address, contact information, etc.;
- access to *IESO* systems;
- Participant and service provider authorization type;
- bank account data; ~~and~~
- supporting documentation (e.g., *prudential* support, OEB licence, CER permit); and
- applicable market control entities or market control entity for physical withholding.

Chapter 9, section 6.18 of the *market rules* requires that all Participants provide details of changes to bank details or *settlement account* details at least 60 *business days* before the change takes effect.

4.1.1.   Change Organization Name

When a Participant or service provider wishes to change their organization name, as stated in the original *participation agreement*, then the Authorized Representative must initiate a change by sending a request to market.registration@ieso.ca as soon as possible after the name change date has been officially set. The request should include the reason for the name change. The

Participant or service provider will be instructed to upload applicable supporting documents through Online IESO (e.g., official statement of merger or buyout).

After the *IESO* reviews the supporting documents, including a possible *IESO* Legal review, the *IESO* will advise the Authorized Representative whether any additional supporting documents are needed. If no additional supporting documents are needed, the Participant or service provider will then re-register the organization, using the procedures in [section 2](#). A new *participant agreement* will be generated, printed, and issued for signature as described in [section 2.1.1.](#)

Market participants must update their *prudential support* information. Additionally, they must update and submit their *OEB Licence* and (if applicable) CER permit (refer to [section 2.2.1](#)).

4.1.2.   Change Participation Type

Upon receiving a request from a *market participant* to change their participation type, the *IESO* assesses any possible impact the requested class change may have on the *market participant's facility* information, and whether the change has any real or potential impact on the *security* and *reliability* of the *IESO-controlled grid*.

4.1.3.   Access Additions/Changes to IESO Systems

Rights Administrators may need to update, add, or delete users to access to the *IESO* systems used for exchanging data between themselves and the *IESO* (e.g., Online IESO, IESO Portal). For these situations, refer to [Market Manual 1: Market Entry, Maintenance & Exit Part 1.3: Identity Management Operations Guide](#) for information on system access.

4.1.4.   Changes to Mandatory Organization Contacts

Participants or service providers may request a change to one of their mandatory organization contacts (refer to [section 2.1](#)) by submitting a task through [Online IESO](#) on the day before the change is to take effect, or as soon as possible after. The change must be requested by another mandatory organization contact as described below:

- a request to change an Applicant Representative may be submitted any mandatory organization contact who is registered in Online IESO;
- a request to change a Rights Administrator may be submitted by either an Authorized Representative, Primary Contact, or another Rights Administrator who is registered in Online IESO and is still functioning in that role; and
- a request to change a Primary Contact may be submitted either by an Authorized Representative or another Primary Contact who is registered in Online IESO and is still in that role.

Online IESO sends an automatic annual email notification to each participant on the anniversary date of their registration requesting they confirm that their mandatory organization contacts are accurate, or to make any necessary changes.

4.1.4.1 Changing an Authorized Representative

A request to change an Authorized Representative may be submitted through Online IESO by any mandatory organization contact. However, the request must be accompanied by a letter (on company letterhead) from either the new Authorized Representative, or from another Authorized Representative who is registered in Online IESO and is still in that role. The letter must include the following information:

- name (legal and if applicable, known name), email address and phone number of the new Authorized Representative;
- attestation either from self (if the new Authorized Representative is to be the only Authorized Representative) or from the Authorized Representative writing the letter that the person identified is now an Authorized Representative;
- attestation that the new Authorized Representative has the authority to contractually bind the company;
- attestation that any registered Authorized Representatives who are no longer in that role should be removed from that role;
- the effective date of the Authorized Representative change; and
- printed name and signature of the Authorized Representative writing the letter.

4.1.4.2 Changing all Mandatory Organization Contacts

In a situation where all of a Participant or service provider's registered mandatory organization contacts have changed (e.g., a complete management turnover), a representative of the organization's new management who has the authority to contractually bind the company should contact *IESO* Customer Relations (customer.relations@ieso.ca) to begin the process of registering their new mandatory organization contacts.

4.2.   Facility, Equipment and Resource Data Maintenance

After approving a *facility* for participation in the *IESO-administered markets*, the *IESO* uses the maintenance procedures to ensure that all *facilities* continue to meet the minimum requirements defined by the *market rules*. In addition, the maintenance procedures ensure that any changes or additions to *facilities* and their associated *resources* participating in the *IESO-administered markets,* or their related data stored in Online IESO*,* do not negatively impact the *security* or *reliability* of the *IESO-controlled grid*. For example, *facility* maintenance is required in the following circumstances:

- market participation changes, such as:
  - resource type (generation resource, load resource, etc.);

- o bid/offer type data parameter for generation resources (dispatchable [regular][22], non-dispatchable, self-scheduling, intermittent);
- o *bid/offer* type data parameter for *load resources* (*dispatchable* [regular][23], day-ahead price responsive[24], non-*dispatchable*);
- o *operating reserve* class (10-minute or 30-minute);
- o facility type (generation facility, load facility, etc.);
- o combined cycle *facility* modelling (*pseudo unit* model, etc.);
- physical site modifications (e.g., changes in MW output, ramp rates, governor models, data monitoring, and voice communication equipment, etc.); and
- changes in operational control, as defined by the *registered market participant; and*
- changes to market control entities, as applicable.

Participants manage their *facility*, *resource*, and equipment data, and applicable relationship data using Online IESO. These persons are required to submit a change request through Online IESO to notify the *IESO* about any changes, additions or deletions to data concerning their *facilities.* These changes may impact the data stored in Online IESO or the supporting documentation relating to the *facility*.

Any changes that a Participant cannot make through Online IESO must be emailed to market.registration@ieso.ca. The *IESO* will update the relevant data in Online IESO, which the Participant can then confirm by accessing their Online IESO registration data.

Depending on the nature of the change request, the *IESO* may need to prepare and issue a RAN to the Participant in order to approve the change. As a guideline to Participants with existing *facilities*, the *IESO* will issue a RAN for changes including, but not limited to:

- *resource* data parameter changes:
    - o operating reserve class;
    - o decease/increase in maximum capacities;
    - o bid/offer type,
    - o MRT, MGBRT, MLP; and
    - o participation in an *IESO* program (e.g., generator offer guarantee status);
- equipment data changes (including operating nomenclature changes):
    - o breaker, transformer, and switch replacements;
    - o static VAR Compensator (SVC), STATCOM, capacitor and reactor;

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[22] Sandbox testing, facilitated by the *IESO*, is required for new *registered market participants* becoming *dispatchable* for the first time. Sandbox testing provides the ability for a *market participant* to familiarize themselves with the *dispatch workstation*.

[23] Sandbox testing, facilitated by the *IESO*, is required for new *registered market participants* becoming *dispatchable* for the first time.

[24] Sandbox testing, facilitated by the *IESO*, is required for new *registered market participants* becoming *price responsive* for the first time.

- o Remedial Action Scheme; and
  - o modifications to *Automatic Voltage Regulator* (*AVR)*, Power System Stabilizer (PSS); and
- relationships changes for at a *facility* or *boundary entity resource* (i.e., ownership, operation, or *registered market participant* changes).

A RAN will generally not be issued for changes to *facility* contact information, user-*resource* relationship, protection changes to an existing *facility*, and *revenue metering* changes.

It is recommended that the person email market.registration@ieso.ca early in the change process to determine if a RAN is required.

The following subsections cover specific types of *facility* data changes.

4.2.1. Data Monitoring and Voice Communications Changes

Any change to a Participant's data monitoring or voice communications requires re-submission via Online IESO and, if necessary, revised Single-Line Diagrams. Changes to this data may require the Participant to redo certain *facility* tests (refer to section 3.2.5). After assessment of the requested changes, the *IESO* will notify the Participant through Online IESO whether the requested changes have been approved or denied.

4.2.2. Changes to Bid/Offer Type Registration Parameter for Load Resources

(Market Rules: Chapter 7, sections 2.2.25 and 2.2.26)

As described in section 3.5.1 of this *market manual*, existing *load resources* can indicate their intent to participate in the *IESO-administered markets* as a *dispatchable load*, a *non-dispatchable load* or a *price responsive load* when submitting the *bid/offer* type *resource* parameter. A *load resource* can change its intent by requesting a change of the *bid/offer* type *resource* parameter to be approved from the *IESO*. Depending on the nature of the change, a *load resource* will have to complete additional stages in the Connecting to Ontario's Power System process as described in section 1.1 of this *market manual*. Requirements for each type of change in the *bid/offer* type of a *load resource* are summarized in the headings below.

4.2.2.1 Changing from a Non-Dispatchable Load to a Dispatchable Load

Market participants that request a change to their *bid/offer* type from a *non-dispatchable load* to a *dispatchable load* must do so at least six months prior to the effective date. *Market participant* contacts registered with the *IESO*, including the Equipment Registration Specialist and Revenue Metering contact, must complete several requirements at least five *business days* prior to the effective date, including but not limited to the requirements set out below:

- the Register Equipment procedure as a *dispatchable load*, including all applicable prerequisite requirements indicated in section 3.1.1 of this *market manual*;

- assignment of all applicable *market participant|resource* relationships as described in section 3.1.5 of this market manual;
- all applicable metering and data monitoring requirements (e.g., *dispatch workstation*) as described in section 3.2 of this *market manual*; and
- submission of all *facility*, equipment and *resource* data required by a *dispatchable load* as indicated in the Register Equipment Help File.

4.2.2.2   Changing from a Non-Dispatchable Load to a Price Responsive Load

Market participants that request a change to their *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. *Market participant* contacts registered with the *IESO*, including the Equipment Registration Specialist and Revenue Metering contact, must complete a number of requirements at least five *business days* prior to the effective date, including but not limited to the requirements set out below:

- the register equipment procedures as a *price responsive load*, including all applicable prerequisite requirements indicated in section 3.1.1 of this *market manual*;
- assignment of all applicable *market participant|resource* relationships as described in section 3.1.5 of this market manual;
- all applicable metering and data monitoring requirements as described in section 3.2 of this *market manual*; and
- submission of all *facility*, equipment and *resource* data required by a *dispatchable load* as indicated in the Register Equipment Help File.

4.2.2.3   Changing from a Dispatchable Load or a Price Responsive Load to a Non-Dispatchable Load

Market participants that request a change to their *bid/offer* type from either a *dispatchable load* or *price responsive load* to a *non-dispatchable load* must do so at least seven *business days* prior to the effective date.

Once the change to the *bid/offer* type to takes effect, *market participants* will not be permitted to revert their *bid/offer* type back to a *dispatchable load* or *price responsive load* for a minimum period of 12 months.

4.2.3.   Assessments for Operating Reserve Market Participation

Requests to change a *resource's* registration data to allow it to be used for participation in the *operating reserve market* will be subject to the following assessments:

- whether the *resource* is eligible to provide 10-minute spinning reserve. Boundary entities are not eligible to offer spinning 10-minute operating reserve;
- whether the *resource's* registration data indicate that there may be difficulty in providing *ten-minute operating reserve* vs. *thirty-minute operating reserve*; and

- whether the *dispatchable load facility* is eligible to provide ten-minute operating reserve or thirty-minute operating reserve.

4.2.4. Changes to Self-Scheduling Generators

(Market Rules: Chapter 7, sections 2.2.9 and 2.2.11)

Requests for changes to *self-scheduling generation facilities* and any associated *resources will* be assessed with respect to:

- ensuring that the *resource* associated with the *self-scheduling generation facility* is between 1 MW and 10 MW nameplate rating, and is within the *IESO control area;* and
- whether the changes to the noted *resource* will affect *IESO-controlled grid security*.

4.2.5. Changes to Intermittent Generators

(Market Rules: Chapter 7, section 2.2.15)

Requests for changes to *intermittent generation* will be assessed ensuring that the change to the *facility* will not affect *security* of the *IESO-controlled grid*. Participants shall submit sufficient documentation for the intermittent status and this documentation must be approved by the *IESO*. The documentation must demonstrate that the *generation facility* generates on an intermittent basis as a result of factors beyond the control of the *generator*.

4.2.6. Changes to Cogeneration Facilities

(Market Rules: Chapter 7, section 2.2.23)

A *cogeneration facility* that is currently deemed to be a *transitional scheduling generator* is required to be re-registered as a *dispatchable*, *self-scheduling,* or *intermittent generation facility* within one month of the coming into effect of the amendment to the applicable Power Purchase Agreement with the *[Ontario Electricity Financial Corporation (OEFC)](.)*.

4.2.7. Transfer of Facility Registration

(Market Rules: Chapter 7, section 2.5)

Market participants who wish to transfer the registration of a *facility* to other *market participants* as a result of their intent to sell, lease, assign or transfer control of that *facility* must 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. The request must specify:

- the identity of the transferee and whether or not they are or intend to be a *market participant*; and
- the date on which the proposed transfer is to take place.

The *market participant* to whom the *facility* is to be transferred must provide to the *IESO*:

- confirmation that it is willing and able to assume control of the *facility* to be transferred and to comply with all provisions of the *market rules* related to *facilities* and any *reliability must-run contract* or *contracted ancillary services* contract applicable to the *facility*;
- a new connection agreement;
- a new OEB licence;
- a new or revised *restoration participant attachment* (if applicable);
- any changes related to the operational control of the *facility* (e.g., new *registered market participant* data);
- any changes to market control entities or market control entity for physical withholding (if applicable);
- information concerning any planned changes to the *facility*'s physical characteristics or its associated data monitoring or voice communications equipment; and
- information concerning changes to contacts for the *facility*.
- In a rare case, where the *facility* or associated *resources* refer to the prior *market participant's* name, the new *market participant* will be required to register new *facility* and associated *resources* in Online IESO with a different name. This is to ensure they do not negatively impact the *security* or *reliability* of the *IESO-controlled grid*. The new *facility* owner is also expected to complete this registration change with their applicable *transmitter* or *distributor*.
- If the proposed transferee is not a *market participant* at the time the request for transfer is made, the *IESO* will not approve the transfer until such time as the transferee has completed the Participant Authorization procedures (refer to section 2). All obligations will remain with the current *market participant*.

4.3.   Document Changes

(Market Rules: Chapter 1, section 11.1 and Chapter 2, section 3.1.8)

Market participants are required to resubmit the following documentation to the *IESO* any time the content of the original document changes:

- OEB licence;
- connection agreement;
- Restoration Participant Attachment;
- Single-Line Diagram;
- Protection Description Document;
- Operational Philosophy Document;
- Facility Description Documents; and

- technical data, such as capability curves, protection document, operational philosophy, etc.

Once an updated document has been stored in Online IESO, the previous version is archived in the *IESO* document management system, where it can be accessed if required.

— End of Section —

5. Facility Deregistration/Market Participant Withdrawal

5.1. Facility Deregistration

(Market Rules: Chapter 7, section 2.4)

Market participants who wish to deregister one or more *facilities* are required to file a Notice of Request to Deregister with the *IESO* Manager, Operations Integration by email (market.registration@ieso.ca).

The request to deregister should include, at a minimum, the following information:

- market participant name;
- facility name;
- facility ID;
- *resource* name(s);
- reason for deregistration
- the expected deregistration date; and
- confirmation that deregistration of the *fa*cility will not potentially:
  - o endanger the safety of any person;
  - o damage equipment; or
  - o violate any *applicable law* (e.g., environmental).

The *IESO* will review the request and may ask the *market participant* to provide additional data if required.

As stated in Chapter 7, section 2.4.8 of the *market rules*, *generators* with *facilities* must provide the *IESO* with at least six months' notice of plans to retire a *facility*, in addition to notification of any plans the *generator* may have to construct replacement facilities for those being retired. This notice is necessary so that the *IESO* has sufficient time to assess the impact the deregistration could have on the *reliability* of the *IESO-controlled grid*, and whether a full technical assessment is required.

5.1.1. Determining Whether Technical Assessment Is Required

Within 10 *business days*[25] of receiving a *market participant*'s request to deregister a *facility*, the *IESO* will inform the *market participant* and *the transmitter* to whose *transmission system* the

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[25] The deregistration of a generator, for example, may require a sufficiently longer time period to determine whether a technical assessment is required.

facility is *connected* (if applicable) as to whether or not an *IESO* technical assessment of the impact of the *facility's* disconnection on the *reliabilit*y of the *IESO-controlled grid* is required.

5.1.2.   When Technical Assessment Is Not Required

If the *IESO* determines that a technical assessment of a deregistration is not required, the *IESO* will email the *market participant* and inform them of this decision. The *market participants* will then inform the *IESO* of the date they wish to have the deregistration take effect. The deregistration date:

- may not be less than five *business days* after the date on which the *market participants* received the *IESO's* notification that the deregistration would not require a technical assessment; and
- as applicable, is subject to the date on which the *facility* has been *disconnected* as confirmed to the *IESO* by the relevant *transmitter*.

5.1.3.   When Technical Assessment Is Required

If the *IESO* determines that a technical assessment is required, they will notify the *market participants* and the *transmitters* of the anticipated completion date of the assessment, which can be no more than 45 *business days* from the notification date, unless a longer timeframe is mutually agreed upon by the *IESO* and the *market participants*.

Table 5-1: Actions during Deregistration

If the technical assessment indicates that deregistration of the facility:	IESO/ Participant Actions
• impacts, or could potentially impact the *reliability* of the *IESO-controlled grid*; or • could potentially endanger the safety of any person, damage equipment, or violate any *applicable law* (e.g., environmental);	• The *IESO* will not grant approval for the deregistration of the *facility*. • The *IESO* Contract Management staff and the relevant *market participant* are required by the *market rules* to enter into good faith negotiations to conclude an agreement for a *reliability must-run contract* for the applicable *facility*[26].

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[26] The applicable *facility* may be either generation, transmission, or load. For more information on *reliability must-run contracts*, refer to Chapter 7, Section 9.6 and 9.7 and Chapter 5, Section 4.8 of the *market rules*.

If the technical assessment indicates that deregistration of the facility:	IESO/ Participant Actions
- does not impact the reliability of the IESO-controlled grid; - does not endanger the safety of any person, damage equipment, nor violate any applicable law (e.g., environmental); If the *facility* is not directly *connected* to the *IESO-controlled grid*	- Upon receiving the *IESO response* to the deregistration request, the Participant shall email *IESO* to advise of the date they want the *facility* deregistered. - The deregistration date shall not be less than five (5) *business days* from the date the Participant receives the notification from the *IESO* that the deregistration request is approved. The *IESO* will issue a disconnection letter to the *distributor* or host customer, noting that the *facility* will be deregistered and the date of the deregistration. The distributor or host customer will notify the *IESO* when the *facility* is *disconnected*.
- does not impact the reliability of the *IESO-controlled grid*; - does not endanger the safety of any person, damage equipment, nor violate any applicable law (e.g., environmental); and If the *facility* is directly *connected* to the *IESO-controlled grid*	- Upon receiving the *IESO response* to the deregistration request, the *market participant* shall email IESO to advise of the date they want the *facility* deregistered. - The deregistration date shall not be less than five (5) *business days* from the date the Participant receives the notification from the *IESO* that the deregistration request is approved. The *IESO* will then: 1. Issue a disconnection letter to the relevant *transmitter*, directing it to disconnect the *facility* from the *IESO-controlled grid* on the date specified in the notice filed by the *market participant*; and 2. Deregister the *facility* on the date they receive confirmation from the relevant *transmitter* that the *facility* has been *disconnected*.
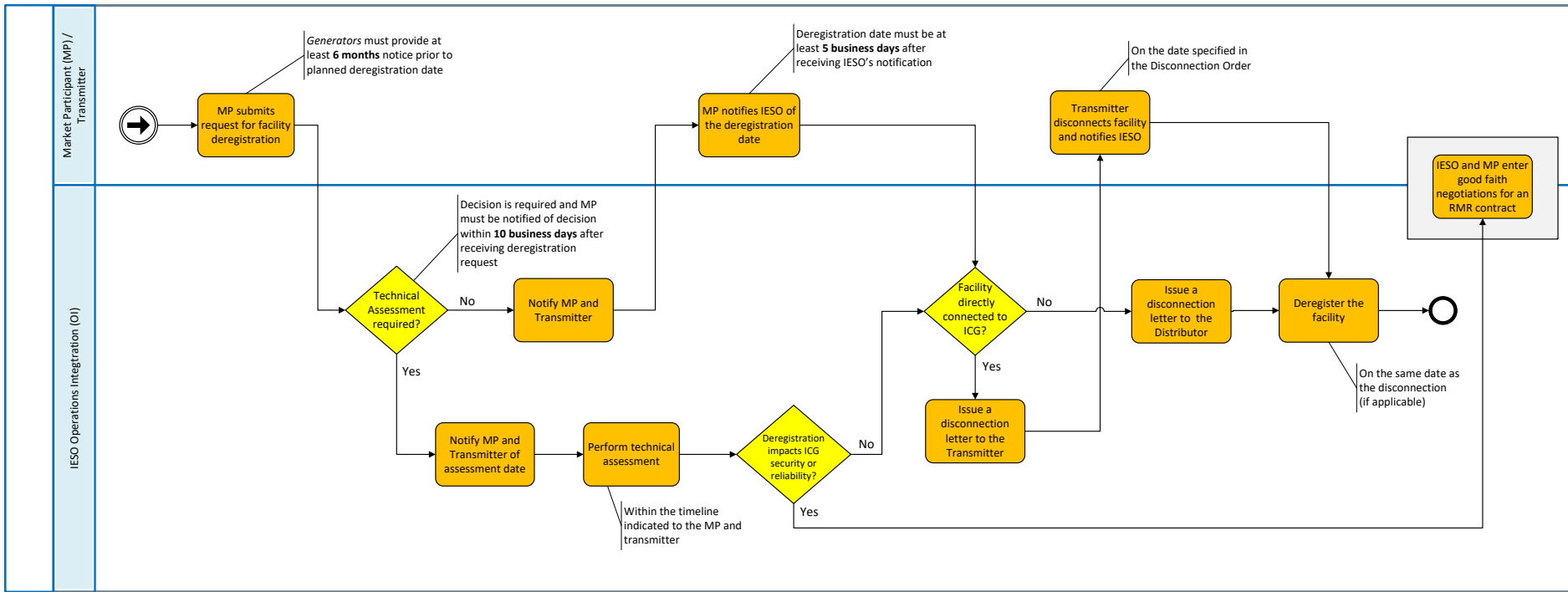
Figure 5-1: Facility Deregistration Process (requested by Market Participant)

The diagram contains the following elements:

Market Participant (MP) / Transmitter lane:

- *Generators* must provide at least **6 months** notice prior to planned deregistration date
- MP submits request for facility deregistration
- Deregistration date must be at least **5 business days** after receiving IESO's notification
- MP notifies IESO of the deregistration date
- On the date specified in the Disconnection Order
- Transmitter disconnects facility and notifies IESO
- IESO and MP enter good faith negotiations for an RMR contract

IESO Operations Integration (OI) lane:

- Decision is required and MP must be notified of decision within **10 business days** after receiving deregistration request
- Technical Assessment required? — No → Notify MP and Transmitter
- Yes → Notify MP and Transmitter of assessment date
- Perform technical assessment
- Within the timeline indicated to the MP and transmitter
- Deregistration impacts ICG security or reliability? — No / Yes
- Facility directly connected to ICG? — No / Yes
- Issue a disconnection letter to the Transmitter
- Issue a disconnection letter to the Distributor
- Deregister the facility
- On the same date as the disconnection (if applicable)

5.2. Market Participant, Program Participant or Service Provider Withdrawal

(Market Rules: Chapter 2, section 9)

The following types of Participants and service providers must complete and submit an [Application for Withdrawal form to the *IESO:*](#)

- *market participants* who no longer wish to participate in any of the *IESO-administered markets;*
- program participants who no longer wish to participate in any of the *IESO's* programs; and
- service providers who no longer wishes to provide services to the *IESO.*

The Participants or service providers are also required to submit their final contact information together with a request to revoke all user system access and digital certificates when notified by the *IESO*.

The Participant or service provider withdrawal procedures are distinct from terminating participation from the *IESO-administered markets*, which is covered in [section 5.3](#). *Market participants* with *facilities* that are registered by the *IESO* shall apply to the *IESO* to transfer or deregister their applicable *facilities* before they submit their application for withdrawal (refer to [section 5.1](#)).

The Application for Withdrawal form specifies the date which the Participant or service provider wishes to withdraw. For a *market participant*, the withdrawal date shall not be earlier than the date on which:

- the last of the *market participant's* applicable *facilities* is to be deregistered by the *IESO* and, where applicable, *disconnected* from the *IESO-controlled grid*; or
- the last of the *market participant's* applicable *facilities* is to be transferred by the *IESO* to another eligible *market participant*.

Participants' or service providers' application for withdrawal will be reviewed and assessed by the appropriate *IESO* groups with respect to its potential impact on the *reliability* and *security* of the *IESO-controlled grid*, as described in sections [5.1.1](#) through [5.1.3](#). If the *IESO* concludes that the removal from service of a *facility* will, or is likely to have, an unacceptable impact on the *reliability* of the *IESO-controlled grid*, the *IESO* and the *market participant* shall enter into good faith negotiations to conclude an agreement for a *reliability must-run contract* for the applicable *facility*[27]. The *facility* shall not be removed from service during the course of such a process.

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[27] The process is described in Chapter 7, Section 9.6 and 9.7 and in Chapter 5, Section 4.8 of the *market rules* as explained in Chapter 7, Section 2.4.5.

If the *IESO* determines that a Participant or service provider's withdrawal can proceed as per the Application for Withdrawal, the *IESO* will send the Participant a RAN confirming that the company is authorized to withdraw, and will update the participant's registration record to indicate that they have withdrawn their participation in the *IESO-administered markets* or applicable programs.

A *market participant* who has given notice of their intention to withdraw from the *IESO-administered markets* will cease to be a *market participant* on the latest of the following dates:

- the withdrawal date specified on the Application for Withdrawal form;
- the date the last of the *market participant's* applicable *facilities* and their associated r*esources* are deregistered by the *IESO* and, where applicable, *disconnected* from the *IESO-controlled grid*;
- the date the last of the *market participant's* applicable *facilities* and their associated *resources* have been transferred by the *IESO* to another eligible *market participant*;
- the date that all payments due from the *market participant* have been received by the *IESO*.

5.3. Market Participant Deregistration or Termination for Non-compliance

5.3.1. Termination Order

(Market Rules: Chapter 3, section 6.4)

Market participants are monitored on an ongoing basis for compliance with their obligations under the *market rules*. A breach of the *market rules* may result in the *IESO* issuing to the *market participant* a financial or non-financial penalty, a *suspension order*, or a *termination order*.

The *IESO* can also issue a *termination order* if a *market participant* has been wound up, dissolved or otherwise has ceased to exist.

A *termination order* results in the forced withdrawal (termination) of the *market participant* from the *IESO-administered markets.*

For complete information on the compliance processes, including the issuance of *termination orders* by the *IESO*, refer to Market Manual 2: Market Administration Part 2.6: Treatment of Compliance Issues.

5.3.2. Deregistration for Non-Compliance

(Market Rules: Chapter 3, section 6.5)

The *IESO* may seek to deregister a *facility* and its associated *resources* as a result of the suspension of a *market participant* for non-compliance with the *market rules* or as a result of

persistent breaches of the *market rules* by the *market participant*. This deregistration activity may be restricted to a specific *facility* and its associated *resources* or may be part of the process to terminate the *market participant's* participation in the *IESO-administered markets*. For more information on this process, please refer to:

- [Market Manual 2: Market Administration Part 2.6: Treatment of Compliance Issues](#)
- Chapter 3, sections 6.2 and 6.2A of the *market rules*

– End of Section –

Appendix A: Organization Contact Roles

Table A-1 lists the contact roles that may be assigned, depending on participation type, by an organization's Applicant Representative. This step-by-step guide will assist an Applicant Representative in adding and updating contact roles.

Table A-1: Organization Contact Roles

Role	Description
Bids and Offers	Person or section to be contacted regarding the *bids* or *offers* for the organization.
Capacity Auction Contact	Person responsible for all tasks related to capacity auction.
Communications and Customer Service	Person or section responsible for receiving *IESO* information on communications and media issues and/or delivering customer service for the organization.
Compliance and Market Surveillance	Person responsible for discussing participant conduct and activities within the *IESO-administered markets* for the organization.
Contributor Information Contact	Person responsible for all tasks related to contributor information for the organization.
Control Room Section	Control room section for the organization.
Day-Ahead Bids and Offers	Person or section responsible for submitting and/or changing day-ahead *bids* or *offers* for the organization.
Dispatch Data Submitter	Person responsible for submitting and/or changing the real-time *bids*, *offers* or schedules for the organization.
Dispatch Data Viewer	Person responsible for viewing submitted real-time *bids*, *offers* or schedules for the organization.
Dispatch Instruction Operator(s)	Person(s) responsible for receiving, accepting, or rejecting *dispatch* instructions. Each *market participant* who may receive dispatch instructions must have at least one Dispatch Instruction Operator registered with the *IESO*.
e-Tag Curtailment	Person or section responsible for receiving notifications regarding the limiting of energy flow on an arranged and/or confirmed interchange transaction for the organization.
Emergency Preparedness Plan	Person responsible for submitting and updating the *emergency preparedness plan* for the organization.

Role	Description
Equipment Outage Submitter	Person responsible for submitting, updating, canceling and viewing outage requests on equipment owned or operated by the organization.
Equipment Outage Viewer	Person who can view outage information on equipment owned or operated by the organization, and equipment permitted for viewing by other organizations. **Note:** Do not select this role if the **Equipment Outage Submitter** is already selected for this individual.
Equipment Registration Specialist	Person responsible for submitting attributes to their equipment, *facility*, and *resources* for the organization. For more information, refer to section 3.1.2.
Information Technology	Person or section responsible for communicating with the *IESO* about information technology services, projects, and changes for the organization.
Invoicing and Banking	Person responsible for submitting and maintaining, or approving banking information for the organization.
Metered Market Participant Meter Trouble Report	Person responsible for monitoring Meter Trouble Reports, adding comments, and receiving Meter Trouble Reports status notifications.
Metering Service Provider Meter Trouble Report	Person responsible for responding to and initiating Meter Trouble Reports on meter issues and outages.
Metering Service Provider Revenue Metering	Person responsible for submitting meter registration requests, monitoring in-flight requests and data and viewing the master data for registered meter installations.
Market Participant Compliance Contact	Person responsible for reliability compliance under the Ontario Reliability Compliance Program for the organization. This includes preparing and submitting self-certifications, periodic data submittals, and data requests. In case of potential non-compliance, the compliance contact is responsible for submitting self-reports and providing associated mitigation plans.
Market Participant Escalation Contact	Person responsible for reporting reliability compliance on escalated matters (e.g., due dates are missed) under the Ontario Reliability Compliance Program for the organization. This person is preferably of higher authority than the person designated as the Market Participant Compliance Contact.
Notice of Disagreement	Person responsible for submitting Notices of Disagreement for *settlement* statements for the organization.
Prudential Requirements	Person responsible for submitting prudential information and is the point of contact for any issues regarding prudential security (e.g., margin calls, warnings and defaults) for the organization.

Role	Description
Revenue Metering	Person responsible for viewing the master data for registered meter installations and in-flight data submitted during a meter registration request. The Revenue Metering contact for a transmitter organization is responsible for approving Site Registration Reports for transmission delivery points.
Revenue Metering Data	Person responsible for managing meter data report profiles, as well as requesting and retrieving revenue meter data reports for the organization.
Settlements	Person responsible for issues/questions relating to settlement statements for the organization.

– End of Section –

Appendix B: Technical Requirements

Please refer to Chapter 2, section 6.1 6.2, 6.3, Chapter 2, Appendix 2. 2, Chapter 4, Chapter 5, section 12 of the *market rules* for information related to the technical requirements of *market participants*. Other portions of Chapter 5 and Chapter 7 may contain material relevant to the technical requirements.

Table B-1 contains references to technical communications requirements contained in the *market rules*. Given the detailed nature of these references, future rule amendments may alter them. It is the *market participant's* responsibility to confirm whether or not any rule amendments made to the *market rules,* subsequent to the publication of this procedure, change these references. The latest Market Rule Amendments (as posted on the *IESO* website) shall prevail in case of any errors or omissions.

Table B-1: Market Rule Technical Requirements

	Chapter 2 & Appendices				Chapter 4 & Appendices	Chapter 7	
						Communications Reliability	
	General	Voice	Data Monitoring	Workstations	Data Monitoring Requirements & Performance Standards	Data & Workstations	Voice
All	Ch. 2, Sec 6.1, 6.3 App 2.2, Sec 1.5	App 2.2, Sec 1.1, 1.1.7-11	App 2.2, Sec 1.2, 1.2.6	App 2.2, Sec 1.3 (dispatch) 1.4 (participant)	Ch. 4, Sec 7.1, 7.6A, 7.7 (maintenance & repair, MTBF, response times), 7.8 (Reclassification)	Sec 12.1.1, 12.1.2, 12.1.4–6, 12.3	Sec 12.2 12.2.1–12, 12.4
Generators		App 2.2, Sec 1.1.1, 1.1.2	App 2.2, Sec 1.2.1		Ch. 4, Sec 7.3 App 4.2, item 9, 4.15, 4.19	Sec 12.1.1.2 12.1.3.1–2	
Distributors		App 2.2, Sec 1.1.3	App 2.2, Sec 1.2.4		Ch. 4, Sec 7.5 App 4.17, 4.22	Sec 12.1.3.4–5	
Transmitters		App 2.2, Sec 1.1.4	App 2.2, Sec 1.2.3		Ch. 4, Sec 7.2, 7.4 App 4.4, item 9, 4.16, 4.20, 4.21	Sec 12.1.3.3	
Wholesale consumer		App 2.2, Sec 1.1.5	App 2.2, Sec 1.2.2		Ch. 4, Sec 7.5 App 4.17, 4.22	Sec 12.1.3.1–2 12.1.3.4–5	
Embedded Loads		App 2.2, Sec 1.1.6	App 2.2, Sec 1.2.5		Ch. 4, Sec 7.6 App 4.18, 4.23	Sec 12.1.3.1–2	

– End of Section –

Appendix C: Wind Facility Data Requirements

Table C-1 identifies *facility* data requirements for the physical layout and details of the turbines. *Market participants* must also refer to section 3 for registration requirements.

Table C-5-2: Wind Facility Data Requirements

#	Static Plant Data	Description
1	Turbine Hub location	Turbine Hub location (latitude and longitude), height, and elevation from sea level.
2	Meteorological (MET) Tower or Sodar or Lidar Unit location	Physical location (latitude and longitude), height of measurements, and elevation from sea level. Met towers require measurement at hub height, sodar/lidar units should measure at hub height as well as 50 and 110 m if possible
3	Type of turbine	Whether the turbine is a horizontal or vertical axis type.
4	Manufacturer's power curve	Power curve maps containing expected output for a turbine at varying wind speeds.
5	Cut in speed	The lowest wind speed (metres per second [m/s]) at which the turbine will generate power.
6	Cut out speed	The wind speed (m/s) at which the wind turbine will be shut down to prevent physical damage.
7	Cut out temperature	The maximum and minimum ambient temperature (in °C) at which the wind turbine will be shut down to prevent physical damage.

Table C-2 identifies operational monitoring requirements for wind *generation facilities*.

Table C-2: Wind Facility Operational Monitoring Requirements

Operational Monitoring Requirements			
Measurement Type	**Unit of Measure**	**Height of Measurement**	**Precision (to the nearest…)**
MW output[28] (per *facility*)	Megawatt (MW)	N/A	0.1 MW
Available Megawatts[29]	Megawatt (MW)	N/A	0.1 MW

Table C-3 identifies monitoring requirements for wind *generation facilities* from Meteorological towers or sodar or lidar units.

Table C-3: Met Tower and Sodar/Lidar Unit Requirements

Meteorological Tower and Sodar/Lidar Unit Requirements				
#	**Measurement Type**	**Unit of Measure**	**Height of Measurement**	**Precision (to the nearest…)**
1	Wind Speed	Metres per Second (m/s)	Met towers require measurement at hub height, sodar/lidar units should measure at hub height as well as 50 and 110 m if possible	0.1 m/s
2	Wind Direction	Degrees from True North	Met towers require measurement at hub height, sodar/lidar units should measure at hub height as well as 50 and 110 m if possible	1 degree
3	Ambient Air Temperature	Degrees Celsius (°C)	Can be provided from any height	0.1 °C
4	Barometric Pressure	Hectopascals (HPa)	Can be provided from any height	0.1 HPa
5	Relative Humidity	Percentage (%)	Can be provided from any height	1 %

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[28] Megawatts shall be provided as one measurement per *connection point*.

[29] Available Megawatts shall be reported as the sum total of the capacities of all available turbines per *connection point*. This value should not take into account speed or temperature cut-outs (i.e., available MW = max capacity – *outages*).

Table C-4 identifies monitoring requirements for wind *generation facilities* from Nacelle mounted data collection points (temperature, pressure and humidity measurements may be taken at any height at the turbine, not necessarily at the nacelle).

Table C-4: Nacelle-mounted Data Collection Requirements

Nacelle-mounted Data Collection Requirements				
#	Measurement Type	Unit of Measure	Height of Measurement	Precision (to the nearest…)
1	Wind Speed	Metres per Second (m/s)	Hub height	0.1 m/s
2	Wind Direction[30]	Degrees from True North	Hub height	1 degree
3	Ambient Air Temperature	Degrees Celsius (°C)	Can be provided from any height	0.1 °C
4	Barometric Pressure	Hectopascals (HPa)	Can be provided from any height	0.1 HPa
5	Relative Humidity	Percentage (%)	Can be provided from any height	1%

Wind data collected at the nacelle is expected to represent the apparent wind not the true wind value at a *facility*, it does not need to compensate for changes in conditions due to the motion of the rotor blades.

– End of Section –

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[30] Wind direction measured at the nacelle may only be used if properly calibrated and if it continues to be provided when the turbine is not generating.

Appendix D: Solar Facility Data Requirements

Table D-1 identifies *facility* data requirements for the physical layout and details of the solar arrays. *Market participants* must also refer to section 3 for registration requirements.

Table D-1: Solar Facility Data Requirements

#	Static Plant Data	Description
1	Solar *facility* location (latitude and longitude) [31]	Physical location (GPS coordinates) of each solar array[32].
2	Meteorological data collection device location and elevation (latitude and longitude)	Physical location (GPS coordinates) of each met data collection device, its elevation and height of measurement.
3	Elevation and orientation angles of arrays	Height from ground level and angle of each solar array, Tilt (angle with horizontal plane) and Azimuth (angle in North-East-South West Plane)
4	Power Rating	Rated Power at standard test conditions.
5	*Generation capacity* of the generating *facility* and each *generation unit*	The name plate capacity of the entire *facility* with a breakdown for each array within the system. (DC and AC Power at standard test conditions for arrays and power of inverters.)
6	Temperature Coefficient	Temperature coefficient of the module power at the maximum power point.
7	Type of Mounting	Ground Mount, Rooftop, Rack Mount, Fixed or Solar Tracking (single or dual axis)[33], etc.
8	Module Type	Crystalline, Thin-Film, Concentrated PV (CPV) etc.
9	Wind Protection	Wind speed at which panels are stored to avoid damage. (If applicable)

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[31] The physical location should be representative of the GPS coordinates at the centre of each solar array such that every solar panel within that array is within 5 km of the GPS coordinates. In the event that the array is larger, additional GPS coordinates will be required to outline the geographic footprint of the array.

[32] Solar array is defined as a collection of solar panels that share a *connection point* going into an inverter.

[33] If the tracking feature is disabled the *generator* shall notify the *IESO* using the address renewableforecastinfo@ieso.ca with as much notice as possible.

Table D-2 identifies operational monitoring for solar *generation facilities*.

Table D-2: Solar Facility Operational Monitoring Requirements

		Operational Monitoring Requirements			
#	Measurement Type	Definition	Unit of Measure	Data Required for	Measurement Precision
1	MW output[34] (per *facility*)	Current Megawatt (MW) output for the *facility*	Megawatt (MW)	All	0.1 MW
2	Available Megawatts[35]	What the *facility* can produce after deducting *outages*	Megawatt (MW)	All	0.1 MW

Table D-3 identifies meteorological monitoring for solar *generation facilities*.

Table D-3: Solar Facility Meteorological Monitoring Requirements

		Meteorological Monitoring Requirements			
#	Measurement Type	Definition	Unit of Measure	Data Required for	Measurement Precision
1	Plane-of-Array Irradiance (POA)	Measurements perpendicular to the solar receiver	Watts/ Square Metre	Crystalline, Thin-Film, CPV	+/- 1W/m^2
2	Global Horizontal Irradiance (GHI)	The solar irradiance available to a flat-plate collector oriented horizontal to the earth's surface	Watts/ Square Metre	Crystalline, Thin-Film, CPV	+/- 1W/m^2
3	Direct Irradiance (DNI)	The amount of solar radiation received per unit area by a surface that is always held perpendicular (or normal) to the rays that come in a straight line from the direction of the sun at its current position in the sky.	Watts/ Square Metre	CPV	+/- 1 W/m^2

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[34] Megawatts shall be provided as one measurement per *connection point*.

[35] Available Megawatts shall be reported as the sum total of the capacities of all available panels per *connection point* (i.e., available MW = max capacity – *outages*).

		Meteorological Monitoring Requirements			
#	**Measurement Type**	**Definition**	**Unit of Measure**	**Data Required for**	**Measurement Precision**
4	Ambient temperature at the array average height	Ambient temperature at the array average height	Degrees Celsius (°C)	Crystalline, Thin-Film, CPV	0.1 °C
5	Back of Module Temperature[36]	Average temperature at the back of module	Degrees Celsius (°C)	Crystalline, Thin-Film, CPV	0.1 °C
6	Barometric pressure	Barometric Pressure	Hectopascals (HPa)	Crystalline, Thin-Film, CPV	0.1 HPa
7	Wind speed at the average array height	Anemometer	Metres/Second (m/s)	Crystalline, Thin-Film, CPV	0.1 m/s
8	Wind direction at the average array height	Wind vane or wind mast readings	Degrees from True North	Crystalline, Thin-Film, CPV	1 °

– End of Section –

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[36] The GPS coordinates of the back of module temperature measurement locations shall be included.

List of Acronyms

Acronym	Meaning
CAA	Connection Assessment and Approval
CER	Canada Energy Regulator
GOG	Generator offer guarantee
MGBRT	*Minimum generation block run-time*
MLP	*Minimum loading point*
NAESB	North American Energy Standards Board
OEB	*Ontario Energy Board*
RAN	Registration Approval Notification

– End of Section –

References

Document ID & Link	Document Title
MDP_RUL_0002	Market Rules
IMP_GDE_0088	Market Manual 1.3: Identity Management Operations Guide
MDP_PRO_0017	Market Manual 2.1: Dispute Resolution
IMO_PRO_0019	Market Manual 2.2: Exemption Application and Assessment
MDP_PRO_0022	Market Manual 2.6: Treatment of Compliance Issues
MDP_MAN_0003	Market Manual 3.0: Metering Overview
MDP_PRO_0007	Market Manual 3.1: Metering Service Provider Registration, Revocation and De-registration
MDP_PRO_0013	Market Manual 3.2: Meter Point Registration and Maintenance
IMP_PRO_0047	Market Manual 3.7: Totalization Table Registration
IMP_PRO_0057	Market Manual 3.8: Creating and Maintaining Delivery Point Relationships
MDP_PRO_0027	Market Manual 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets
IMP_PRO_0034	Market Manual 4.3: Real-Time Scheduling of the Physical Markets
MDP_PRO_0029	Market Manual 4.4: Transmission Rights Auction
MDP_PRO_0045	Market Manual 5.4: Prudential Support
IMO_MAN_0024	Market Manual 6: Participant Technical Reference Manual (PTRM)
IMP_PRO_0035	Market Manual 7.3: Outage Management
IMO_PLAN_0001	Market Manual 7.8: Ontario Power System Restoration Plan
IMO_PLAN_0002	Market Manual 7.10: Ontario Electricity Emergency Plan
MAN-44	Market Manual 12.0: Capacity Auctions
PRO-357	Market Manual 13.1: Capacity Export Requests
IMO_GDE_0001	Market Participant Emergency Plan Guidelines & Requirements
LST-48	Register Equipment Help File
	Prudential Training Guide

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