
Market Manual 1: Connecting to Ontario's Power System

Part 1.5: Market Registration Procedures

Issue 1.5

~~December 17, 2021~~

September 9, 2022

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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This *market manual* may contain a summary of a particular *market rule*. Where a *market rule* is applicable, the obligation that shall be met is as stated in the *market rules*. To the extent of any discrepancy or inconsistency between the provisions of a particular *market rule* and the summary, the provision of the *market rule* shall govern. Furthermore, all references in the *market manual* to provisions of the *market rules* have been included for the convenience of the reader only, and any such reference shall not be construed as an exhaustive list of provisions of the *market rules* applicable to a given section of the *market manual*. The *IESO* makes no representation or warranty, express or implied about the accuracy or completeness of any such reference.

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Related Documents

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Table of Contents

Table of Contents	i
List of Figures	iv
List of Tables	iv
Table of Changes	vi
Market Manuals	vii
Conventions	vii
1. Introduction	1
1.1. Overview	1
1.2. Scope	3
1.3. Roles and Responsibilities.....	3
1.3.1. Participant or Service Provider	4
1.3.2. IESO.....	5
1.3.3. Training and Reference Documents	6
1.4. Contact Information	6
2. Authorize Market and Program Participation	8
2.1. Register an Organization	8
2.1.1. Participation Agreement.....	10
2.1.2. Initial Access to Online IESO	11
2.2. Register as a Market Participant	12
2.2.1. Submission Requirements.....	12
2.2.2. Classes of Market Participant	16
2.2.3. Organization Roles and Responsibilities	18
2.2.4. Registration Approval Notification for a Market Participant	19
2.3. Register as a Program Participant	20
2.3.1. Submission Requirements.....	20
2.3.2. Program Participant Types.....	20
2.3.3. Registration Approval Notification for a Program Participant.....	21
2.4. Register as a Service Provider	22
2.4.1. Submission Requirements.....	22
2.4.2. Service Provider Types.....	22
2.4.3. Authorization Notification for a Service Provider	23
3. Register Equipment	25
3.1. Roles, Responsibilities and Relationships	26
3.1.1. Equipment Registration Specialist.....	30

3.1.2. Facility Contacts.....	30
3.1.3. Relationships	30
3.2. Registration of Facilities and Equipment	34
3.2.1. Assessment Requirements	35
3.2.2. Submission Requirements.....	35
3.2.3. Metering Requirements	38
3.2.4. Data Monitoring Requirements.....	38
3.2.5. Market Rule Exemptions.....	38
3.2.6. Facility Registration Status	39
3.2.7. Participant and Facility Testing	40
3.3. Registration of Resources for Generators.....	43
3.3.1. General Generation Resource Registration Requirements	53
3.3.2. Dispatchable Hydroelectric Generation Resource Registration Requirements	56
3.3.3. Dispatchable Non-Quick Start Generation Resources.....	60
3.3.4. Combined Cycle Plant	63
3.3.5. Requirements for Generator Offer Guarantee Status.....	69
3.4. Registration of Resources for Wholesale Consumers	69
3.5. Registration of Facilities, Equipment, and Resources for Electricity Storage Participants	76
3.6. Aggregation of Equipment and Resources	82
3.6.1. Resource Compliance Aggregation.....	82
3.7. Participation in Centralized Forecasting Service for Generation Facilities that have Variable Generation Resources	83
3.7.1. Operational and Meteorological Monitoring	83
3.7.2. Meteorological Monitoring - Wind Generation Facilities	84
3.7.3. Meteorological Towers and Sodar/Lidar Technology.....	84
3.7.4. Operational Monitoring - Solar Generation Facilities	85
3.8. Next Steps	85
3.8.1. Commission Equipment	85
3.8.2. Performance Validation	86
4. Maintain IESO Registered Data	87
4.1. Maintain Organization/Participant Registered Data.....	87
4.1.1. Change Organization Name	88
4.1.2. Change Participation Type.....	88
4.1.3. Access Additions/Changes to IESO Systems.....	88
4.1.4. Changes to Mandatory Organization Contacts	88
4.2. Facility, Equipment and Resource Data Maintenance	90
4.2.1. Data Monitoring and Voice Communications Changes	92
4.2.2. Changes to Bid/Offer Type Registration Parameter for Load Resources 92	
4.2.3. Assessments for Operating Reserve Market Participation.....	94

4.2.4. Changes to Self-Scheduling Generators.....	94
4.2.5. Changes to Intermittent Generators	94
4.2.6. Changes to Cogeneration Facilities	94
4.2.7. Transfer of Facility Registration	95
4.3. Document Changes	96
5. Facility Deregistration/Market Participant Withdrawal.....	97
5.1. Facility Deregistration	97
5.1.1. Determining Whether Technical Assessment Is Required	97
5.1.2. When Technical Assessment Is Not Required	98
5.1.3. When Technical Assessment Is Required	98
5.2. Market Participant, Program Participant or Service Provider Withdrawal ...	101
5.3. Market Participant Deregistration or Termination for Non-compliance	102
5.3.1. Termination Order	102
5.3.2. Deregistration for Non-Compliance	103
Appendix A: Organization Contact Roles	105
Appendix B: Technical Communication Requirements	108
Appendix C: Wind Resource Data Requirements.....	112
Appendix D: Solar Resource Data Requirements	115
List of Acronyms	118
References	119

List of Figures

Figure 3-1: Single-Line Diagram Example	31
Figure 3-2: Combined Cycle Plant Relationships and Resource Data Parameter Requirements	66
Figure 5-1: Facility Deregistration Process (requested by Market Participant)	100

List of Tables

Table 1-1: Market Manuals Related to the Connecting to Ontario’s Power System Process	1
Table 2-1: Online Application Form Descriptions	9
Table 2-2: Submission Requirements for Market Participant Authorization.....	12
Table 2-3: Classes of Market Participant and Scope of Participation	16
Table 2-4: Organization Roles and Responsibilities	19
Table 2-5: Requirements to Register as a Program Participant.....	20
Table 2-6: Program Participant Types	20
Table 2-7: Requirements to Register as a Service Provider	22
Table 2-8: Service Provider Types	23
Table 3-1: Market Participant/Resource Role Relationships.....	32
Table 3-2: Submission Requirements for Register Equipment.....	35
Table 3-3: Generation Resource Classification by Bid/Offer Type Resource Data Parameter	46
Table 3-4: Resource Data Parameter Requirements by Generation Resources Classification	47
Table 3-5: Applicability of Financial Reference Levels by Resource Technology Type	54
Table 3-6: Reference Levels for Non-Financial Dispatch Data Parameters.....	55
Table 3-7: Reference Quantities by Technology Type and Market.....	56
Table 3-8: Classification for Load Resources.....	69
Table 3-9: Load Resource Registration Parameters.....	70
Table 3-10: Dispatchable Load Eligibility Criteria.....	72

Table 3-11: Applicability of Financial Reference Levels by Resource Type 74

Table 3-12: Reference Levels for Non-Financial Dispatch Data Parameters 75

Table 3-13: Reference Quantities by Technology Type and Market 75

Table 3-14: Electricity Storage Resource Type versus Registration Requirements.. 78

Table 3-15: Additional Data Required for Electricity Storage Facilities 79

Table 3-16: Electricity Storage Data Monitoring – Evolving Framework for Electricity Storage 80

Table 3-17: Requirements for Operating Reserve Market Participation 81

Table 3-18: Meteorological Tower or Sodar/Lidar Unit Requirements for Wind Facilities..... 84

Table 5-1: Actions during Deregistration 98

Table A-1: Organization Contact Roles 105

Table B-1: Market Rule Technical Requirements..... 109

Table C-1: Wind Resource Data Requirements 112

Table C-2: Wind Resource Operational Monitoring Requirements 113

Table C-3: Met Tower and Sodar/Lidar Unit Requirements..... 113

Table C-4: Nacelle-mounted Data Collection Requirements..... 114

Table D-1: Solar Resource Data Requirements 115

Table D-2: Solar Resource Operational Monitoring Requirements 116

Table D-3: Solar Resource Meteorological Monitoring Requirements 116

~~List of Figures~~

Table of Changes

Reference	Description of Change
Throughout	<p>Market Power Mitigation “Batch 1” changes for the Market Renewal Program. This version incorporates the incremental <u>minor conforming</u> changes associated with Market Power Mitigation, which include the addition of obligations for market participants to determine reference levels <u>reflecting design elements in the following detailed design documents:</u></p> <ul style="list-style-type: none"> • <u>Authorization</u> and reference quantities and to disclose market control entities. <u>Participation</u> • <u>Prudential Security</u> • <u>Facility Registration</u>

Market Manuals

~~The *market* Market manuals consolidate the market procedures set out procedural 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 administrative details with respect to market rule requirements for various activities than are specified in the market rules. Where there is a discrepancy conflict between the requirements described in a document within a market manual or appended document, and those within 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;
- ~~References to market rule sections and sub-sections may be abbreviated in accordance with the following representative format: 'MR Ch.1 ss.1.1-1.2' (i.e. market rules, Chapter 1, sections 1.1 to 1.2).~~
- ~~References to market manual sections and sub-sections may be abbreviated in accordance with the following representative format: 'MM 1.5 ss.1.1-1.2' (i.e. market manual 1.5, sections 1.1 to 1.2).~~
- ~~Internal references to sections and sub-sections within this manual take the representative format: 'sections 1.1 – 1.2'~~
- ~~Terms and acronyms used in this market manual including all Parts therein its appended documents that are italicized have the meanings ascribed thereto in Chapter MR Ch.11 of the "Market Rules";~~
- All user interface labels and options that appear on the IESO ~~portals~~ gateway 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 relevant appended procedure document ~~itself~~.

– End of Section –

1. Introduction

1.1. Overview Purpose

[Market Manual 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.](#)

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

Stage	Market Manual
1-Prepare application	Market Manual 1.4: Connection Assessment and Approval (formerly Market Manual 2.10)
2-Obtain conditional approval to connect	
3-Design and build	N/A ¹
4-Authorize market and program participation (also called Participant Authorization)	Market Manual 1.5: Market Registration Procedures
5-Register equipment	
6-Commission equipment and validate performance	Market Manual 1.5: Market Registration Procedures , and Market Manual 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.

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 participants² ~~(collectively referred to as “Participants”)~~ and service providers³ and reflects the requirements set out in the *market rules* and in certain standards and policies established by the *IESO*.

~~As applicable, the~~The procedures in this *market manual* ~~must be followed by~~are applicable to:

- 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~~market participant or program participant wishing to register equipment (Stage 5);
- any ~~Participant~~market participant or program participant wishing to commission equipment (Stage 6);
- any ~~Participant~~market participant or program participant wishing to update their equipment data;
- any ~~Participant~~market participant, program participant, or service provider wishing to update their registration data;
- any ~~Participant~~market participant or program participant wishing to deregister equipment; and
- ~~any Participant~~any market participant, program participant, or service provider wishing to withdraw their participation from one or more of the *IESO-administered markets* or programs.

~~The 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 Participants⁴ or prospective service providers⁵ have completed the following applicable prerequisite requirements:~~

- ~~for prospective market participants, those described in of this manual;~~

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.~~

- ~~for prospective program participants, those described in of this market manual; and~~
- ~~for prospective service providers, those described in 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 starting the Market Registration procedures described in this *market manual*. Stages 1 and 2 are described in [Market Manual 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~~*market participant, program 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~~*market participants, program participants*, or service providers and the *IESO*.

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

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 MR Ch.2~~ and ~~Chapter MR Ch.7, section ss.2~~);
- complete all applicable pre-application requirements;
- provide all mandatory organization, ~~Participant~~*market participant, program 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*;
- 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 [sections 3.1.4 and 3.1.5](#));
- submit responses to *IESO* requests for incomplete information or clarifications;
- submit appropriate *resource* registration data for participation in the *IESO-administered markets* (refer to [sections 3.2.6, 3.3, 3.4, 3.5 and 3.6](#));
- 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 8, , and)⁷;~~
- review and maintain ~~Participant~~*market participant, program 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](#)).

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.~~

1.3.2. IESO

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

- acknowledge prospective or existing ~~Participant~~*market participant, program participant*, and service provider submissions related to Market Registration activities;
- manage records in Online IESO and ~~Participant~~*market participant, program participant*, or service provider accessibility;
- generate the *participation agreement*, issue to the prospective ~~Participant~~*market participant, program 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;
- based on the *market participant's* intended market operations, create appropriate setup of *facilities* and associated *resources* to enable *dispatch data* and fuel-cost change submissions, *dispatching*, *metering*, and *settlement*⁸;
- coordinate testing schedules with the ~~Participant~~*market participant or program participant* for Market Participant and Facility Testing (refer to [section 3.2.5](#));
- provide the ~~Participant~~*market participant or program participant* with assistance in executing applicable commissioning tests for new or modified equipment (refer to [section 3.9.1](#));
- determine applicable reference levels and reference quantities for a resource ~~based on its participation~~;
- review and approve submissions of or updates to *market control entity* information;
- 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 bodies⁹;
- provide the ~~Participant~~*market participant, program participant*, or service provider with appropriate operational *IESO* contacts; and

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.

- issue Registration Approval Notifications (“RANs”) to the Participant *market participant or program 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 ~~at the end of this manual.~~~~

~~1.4.3.1.3.3. 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.

The [Connection Process page](#) of the *IESO* website contains guidance on the overall connection process and the standard timelines for stages and activities.

~~1.5.1.4. 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

~~2.1. 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 Register an Organization~~

~~(MR Ch.2 ss.3.1.1)~~

~~Prospective *market participants*, program participants, and complete a Request for Authorization.~~

~~The Participant Authorization procedures require prospective Participants or service providers to first must register their organization through the [Online Application Form](#) by providing organizational information on the IESO website. An entity may be registered as any or all of a *market participant*, program participant, 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 of this *market manual*:~~

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

~~Registration requirements for *capacity market participants* are found in , section 5. Registration requirements for capacity export requests are located in , section 6.6.~~

2.1. Registering an Organization

Before starting the Participant Authorization Procedures, prospective Participants or service providers should review the page of the *IESO* website. After reviewing the information, prospective Participants or service providers should complete the [Participant Authorization Form](#), which can be accessed from that page.

The Online Application Form is divided into four sections, [whose requirements are described further in Table 2-1](#) which 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 the following fields : <ul style="list-style-type: none"> • Business Entity Type: prospective Participants or service providers identifyThe applicant identifies 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 ifThe applicant identifies whether they intend to register as a Participantmarket participant, program participant, or a service provider.
3	Mandatory Organization Contacts	This section identifies requires applicants to identify at least one person (preferably more) in the their organization for each of the following contact types. Click the links for more information on each type.: <ul style="list-style-type: none"> • Authorized Representative: Person(s) responsible for contractually binding an organization with the <i>IESO</i>. The Authorized Representative is required to sign the <i>participation agreement</i> (described in section 2.1.1). • Primary Contact: Person(s) responsible for the organization's day-to-day interactions with the <i>IESO</i>. • Rights Administrator: Person(s) responsible for submitting and managing the organization's system access requests for users requiring access to <i>IESO</i> information systems.

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

Section		Contents and Description
		<ul style="list-style-type: none"> Applicant Representative: Person(s) responsible for submitting registration requests for adding and updating contacts, <i>facilities</i>, 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. <p>Mandatory organization information must always be kept up-to-date. For information on changing a mandatory contact, refer to section 4.1.4.</p>
4	Submitter's Contact Information	The section collects the name and contact information of the person who will be the <i>IESO's</i> point of contact for <u>during</u> the registration process.

The data submitted ~~data on using~~ the online application form will ~~require validation and approval~~be validated by the *IESO*. In some cases, the ~~submitted~~*IESO* may require clarification and the data may need to be revised by the prospective ~~Participant~~market participant, program participant, or service provider before it is approved. Once approved, the *IESO* will create organization and ~~contacts~~contact records in [Online IESO](#) ~~(refer to)~~ 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 , , and .~~

2.1.1. Participation Agreement

~~(Market Rules: Chapter MR Ch.2, section ss.1.2.2.3 and MR Ch.6 ss.5.1.3.2)~~

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~~

~~IESO¹¹. A signed participation agreement is required for each person that intends to participate as a Participant or a service provider, and couriered to the Applicant's Authorized Representative for signature and return to the IESO.¹²~~

~~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 signs 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 market participant, program participant, or service provider. A copy of the fully executed participation agreement will be accessible from Online IESO.~~

2.1.2. Initial Access to Online IESO

~~Once the (MR Ch.2 ss.3.1.1)~~

~~The IESO executes the participation agreement, it provides will provide initial access to Online IESO, through an email notification, to all of the prospective Participant market participant's, program participant's or service provider's mandatory organization contacts, for which they will be notified via email from Online IESO. The initial access allows applicable mandatory following the execution of the participation agreement. Mandatory contacts to can complete their assigned Manage Participation tasks found in the procedures (i.e., Actions-section) in Online IESO.~~

~~The guide will assist users when logging into Online IESO for the first time.~~

2.1.1. 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 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~~

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

¹² Under extraordinary circumstances, the IESO may email the participation agreement to the prospective market participant's or program participant's authorized representative.

registering. *Market participant* and program participant types are defined in and . Service provider types are described in . The majority of submission tasks are listed on the page of the *IESO* website and are explained in further detail in . 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. Prerequisite Register as a Market Participant

2.2.1. Submission Requirements for a Prospective Market Participant

Before registering as a *market participant* in the *IESO* administered markets, a (MR Ch.2 ss.1.2.2.4, 1.2.2.6 and 3.1.2, MR Ch.7 ss.22.9 and MR Ch.9 ss.6.18.12)

A prospective *market participant* must submit the applicable 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 Submission Requirements for a Prospective Market Participant Authorization

Type Submission Requirement	Description
IESO Market Entry Application Fee	The <i>IESO</i> charges an application fee for authorization of market participation.
Ontario Energy Board Licence	The is responsible for licensing all market participants in the IESO administered markets. Prospective <i>market participants</i> must have an <i>OEB</i> 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 <i>OEB</i> licence required for each market participation type is described in MR Ch.2 ss.1.2.2.4 .
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 <i>market</i>

<u>Type Submission Requirement</u>	Description
	<i>participant</i> to be paid or <i>invoiced</i> by the <i>IESO</i> must submit relevant Canadian bank account details information .
Import/Export/ e-Tag Data	Prospective <i>market participants</i> seeking authorization as an <i>energy trader</i> are required to identify all <i>interties</i> between the <i>IESO control area</i> and adjacent <i>control areas</i> across which they wish to import, export or wheel <i>energy</i> and import or export <i>operating reserve</i> ¹³ as stated in Chapter MR Ch.7, section ss.2.2.7 of the market rules . These prospective <i>market participants</i> must obtain the relevant e-Tag ¹⁴ 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 <i>NERC</i> and NAESB standards related to <i>interties</i> .
Canada Energy Regulator Permit	Prospective <i>market participants</i> seeking authorization as <i>energy traders</i> to export or wheel electricity over <i>interties</i> between the <i>IESO control area</i> and adjacent <i>control areas</i> must obtain export permits issued by the Canada Energy Regulator ("CER") and must submit the permits to the <i>IESO</i> .
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 and submit to the IESO a Harmonized Sales Tax (HST) registration number _. ¹⁵ . Prospective market participants to be paid or invoiced by the IESO must submit an HST registration number. Prospective <i>market participants</i> that intend on solely participating as either a <i>TR participant</i> , a <i>virtual trader</i> or a <i>capacity auction participant</i> 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.

¹³ Market participants may import energy and operating reserve but can only export energy.

¹⁴ For information on e-Tags, refer to the [North American Energy Standards Board website](#).

¹⁵ For information on HST registration, refer to the [Canada Revenue Agency website](#).

<u>TypeSubmission Requirement</u>	Description
Prudential Support	<p>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 . Each prospective market participant must obtain and submit evidence of their prudential support obligation 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 MM 5.4: Prudential Supportthe.</p>
Emergency Preparedness Plan	<p>Most prospective market participants are required to prepare and submit an emergency preparedness plan for approval by the IESO. Prospective market participants intending to:</p> <ul style="list-style-type: none"> • 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; <u>or</u> • 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; <u>or</u> <p>authorize solely as a capacityCapacity auction participantparticipants, TR participant or participants and virtual tradertraders are not required to submit an emergency preparedness plan.</p> <p>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.</p> <p>Chapter 5, section 11 of the market rulesMR Ch.5 ss.11 describes the content requirements for an emergency</p>

TypeSubmission Requirement	Description
	<p><i>preparedness plan.</i> For more information on EPP preparation, refer to:</p> <ul style="list-style-type: none"> • MM 7.10: Ontario Electricity Emergency Plan (OEEP), Appendix C • Market Participant Emergency Plan Guidelines & Requirements
Market Control Entity	<p>Prospective market participants seeking authorization as the following participation types areThe <u>entities</u> required to disclose their market control entities:</p> <ul style="list-style-type: none"> • virtual trader • energy trader • generator • wholesale consumer • electricity storage participant <p>Prospective market participants from the list above that intend to register the following resources will be required to disclose market control entities:</p> <ul style="list-style-type: none"> • generation resource; • price responsive load; • dispatchable loads; • generation resources at a dispatchable electricity storage facility; • dispatchable loads at a dispatchable electricity storage facility; and • non dispatchable generation resource at a self-scheduling electricity storage facility. <p>The prospective market participant must disclose all market control entities that meet the applicable requirements as set out in Chapter 7, section 22.1 of the market rules. The prospective market participant will not be authorized by the IESO as a market participant until all applicable market control entities are disclosed.</p> <p><u>pursuant to MR: Ch. 7, s. 22.9.1.</u></p>

TypeSubmission Requirement	Description
Market Control Entity for Physical Withholding	<p>Prospective<u>Most prospective</u> market participants seeking authorization as the following participation types are required to disclose their <u>identify the</u> market control entities for physical withholding:</p> <ul style="list-style-type: none"> • generator • wholesale consumer • electricity storage participant <p>Prospective market participants from the list above that intend, pursuant to register the following resources will be required to disclose market control entities for physical withholding:</p> <ul style="list-style-type: none"> • dispatchable generation resource; • dispatchable load resource authorized to participate in operating reserve market. • dispatchable generation resources at a dispatchable electricity storage facility, and dispatchable loads at a dispatchable electricity storage facility<u>MR: Ch. 7, s. 22.9.1.</u>

2.2.2. Classes of Market Participant Types

(MR Ch.2 s. 2.1.1)

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

Table 2-3: Classes of Market Participant and Scope of Participation Types

Participation TypeClass	Scope of Market Participation
Capacity Auction Participant	A person who participates in the <i>capacity auction</i> and submits <i>capacity auction offers</i> . For more information on <i>capacity auctions</i> , refer to <u>MM 12.0: Capacity Auctions</u> . Capacity auction participants do not require an OEB licence.
Capacity Market Participant	A <i>capacity auction participant</i> , who secures a <i>capacity obligation</i> through a <i>capacity auction</i> and satisfies the requirements

Participation TypeClass	Scope of Market Participation
	<p>contemplated in Chapter 7, section 18 of the market rules. Capacity market participants may participate in the day-ahead market and real-time market. MR Ch.7 s. 18. For more information on <i>capacity auctions</i>, refer to MM 12.0: Capacity Auctions. Capacity market participants participating using a demand response resource do not require an OEB licence.</p>
Distributor	<p>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.</p>
Electricity Storage Participant	<p>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.</p>
Energy Trader ¹⁶ Wholesale Seller	<p>A personA wholesale seller is an <i>energy trader</i>¹⁷ who participates in the <i>energy</i> and <i>operating reserve</i> markets by importing, exporting, or wheeling electricity¹⁸. must register as an energy trader.¹⁹ Participation in the <i>operating reserve market</i> is restricted to <i>energy traders</i> <i>wholesale sellers</i> that intend to import <i>energy</i>. 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).</p>

¹⁶ 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](#).

¹⁷ A *generator* or *electricity storage participant* 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 [MM 13.1: Capacity Export Requests](#).

¹⁸ 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.

¹⁹ 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 [MM 4.1: Submission of Dispatch Data in the Physical Markets](#) for more information on this process.

Participation TypeClass	Scope of Market Participation
Generator	A person who owns or operates a generation facility. Generators may participate in the <i>energy market</i> , <i>operating reserve market</i> and <i>procurement market</i> . Generators must have an electricity generator OEB licence.
Retailer	Retailers may participate in the financial markets for <i>settlement</i> 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 <i>energy market</i> . They must have an electricity transmitter OEB licence only.
TR Participant	A person who is authorized to <u>TR participants may</u> participate in the <i>TR market</i> . For information on the participation in the <i>TR market</i> , refer to MM 4.4: Transmission Rights Auction and Chapter 8, section 4.8 of the market rules. TR participants do not require an OEB licence, and MR Ch.8 ss.4.8.
Virtual Trader	A person who is authorized to conduct virtual transactions. Virtual traders that are eligible to <u>may</u> participate in the <i>energy market</i> . Market participants authorized solely as virtual traders shall not participate in the operating reserve market. Virtual traders may and submit dispatch data in the day-ahead market only. Virtual traders do not require an OEB licence.
Wholesale consumer <u>Consumer</u>	A person who owns or operates a load facility. Wholesale consumers may participate in the <i>energy market</i> and <i>operating reserve market</i> . Wholesale consumers that participate in the <i>operating reserve market</i> must be <u>registered as a dispatchable loads</u> . Wholesale consumers must have an electricity wholesaler OEB licence.

2.2.3. Organization Roles and Responsibilities

(MR Ch.2 ss.3.1.1)

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 <i>market participant</i> who owns and maintains a <i>facility</i> or specific equipment within a <i>facility</i> . The owner is responsible for completing the Register Equipment procedure and assigning the <i>registered market participant</i> , <i>metered market participant</i> and operator role relationships to equipment or <i>resources</i> if applicable.
Operator	The <i>market participant</i> responsible for operating the equipment within a <i>facility</i> in the real-time operations.
Registered Market Participant	The Refer to the MR Ch.11 definition of a <i>registered market participant</i> 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 Refer to, and to be settled at, the relevant delivery point. Each delivery point requires the assignment MR Ch.11 definition of a <i>metered market participant</i> .
Metered Market Participant Transmission	The <i>market participant</i> responsible for paying for one or more transmission services to a <i>transmitter</i> relating to an owned <i>facility</i> .

2.2.4. Registration Approval Notification for a Market Participant

(MR Ch.2 ss.3.1.6)

The Applicant Representative(s) of prospective *market participants* who have sufficiently completed their assigned submission tasks in Online IESO, will receive an order authorizing, or conditionally authorizing, the Applicant as described in **MR Ch.2 ss.3.1.6**. This order will be emailed to the Applicant Representative in the form of a RAN or conditional RAN.

After the IESO issues the RAN, the applicant is registered as a *market participant* and can begin the Register Equipment procedure described in [section 3](#) Registering, if applicable.

2.3. Register as a Program Participant

2.3.1. PrerequisiteSubmission Requirements ~~for a Prospective Program Participant~~

(MR Ch.2 ss.3.1.1)

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~~applying to become authorized 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 to Register as a Prospective Program Participant

Type	Requirements
Canadian Bank Account	Prospective program participants that need to be paid or invoiced by the <i>IESO</i> must have a Canadian bank account and must submit relevant bank account details to the <i>IESO</i> .
HST Registration Number	Prospective program participants that need to be paid or invoiced by the <i>IESO</i> must obtain an HST registration number ²⁰ and submit it to the <i>IESO</i> .

2.3.2. Program Participant Types

~~If applicable, prospective~~Prospective program participants ~~can select the their applicable~~ program participant type in [Online IESO](#)~~Online IESO~~. Table 2-6 ~~describes~~lists the ~~available~~ program participant types and scope of their participation.

Table 2-6: Program Participant Types

<u>Participation Type</u>	<u>Description</u> <u>Scope of Program Participation</u>
Centralized Forecasting Provider	A person with wind and solar <u>generation facilities (i.e., that contain variable <i>generators</i>)</u> <u>generation resources</u> connecting to the <i>IESO</i> -controlled grid, or connecting to a <i>distribution system</i> with an installed capacity of 5 MW or greater.

²⁰ For information on HST registration, refer to the [Canada Revenue Agency website](#).

<u>Participation Type</u>	<u>Description</u> <u>Scope of Program Participation</u>
	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 <i>embedded generation facilities</i> (i.e., <i>connected to a distribution system</i>) that are not wind or solar variable generation resources . An <i>embedded generator</i> 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 <u>Consumer</u>	A person that participates with an <i>embedded load facility</i> that is not directly <i>connected to the IESO-controlled grid</i> , but is instead embedded within a <i>distribution system</i> . This person is not required to be an embedded market participant . An embedded load is represented as an embedded load consumer.
<u>Embedded Electricity Storage Participant</u>	A person with one or more embedded electricity storage facilities (i.e., connected to a distribution system). This person is not required to be an embedded market participant.
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 <i>IESO</i> program that is not listed in Online IESO.
Smart Metering Cost Recovery	A person that has a financial <i>settlement</i> with respect to the smart metering charge.
Smart Submetering Provider	A person who has a financial <i>settlement</i> with respect to Ontario Clean Energy Benefit Program Government electricity support program as a Smart Unit Submetering Provider.

2.3.3. Registration Approval Notification for a Program Participant

The Applicant Representative of a prospective program participant that has applied to participate as:

- a centralized forecasting provider;

- an embedded generator;
- an embedded electricity storage facility; or
- an embedded load consumer.

who has sufficiently 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 registering to participate in IESO programs other than the ones set out above (refer to [section 2.3.2 Registering](#)) are notified of their authorization by an email from IESO Energy Efficiency.

2.4. Register as a Service Provider

2.4.1. Prerequisite Submission 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 applying to become authorized 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 to Register as a Prospective Service Provider

Type	Description
Canadian Bank Account	Prospective service providers that need to be paid or invoiced by the IESO must have a submit relevant 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 ²¹ and submit it to the IESO.

2.4.2. Service Provider Types

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

²¹ For information on HST registration, refer to the [Canada Revenue Agency website](#).

Table 2-8: Service Provider Types

Service Type	DescriptionScope of Service
Centralized Forecasting Provider	A <i>forecasting entity</i> that provides a centralized forecasting service relating to <i>variable generation</i> .
<i>Metering Service Provider</i>	<p>A person that provides, installs, commissions, registers, maintains, repairs, replaces, inspects and tests metering installations associated with a resource.</p> <p>For more information, referRefer to MR Ch.11 and to MM 3.8: Creating and Maintaining Delivery Point Relationships.</p>
Meter Data Associate	A person, other than the <i>metered market participant</i> , that has access to <i>metering data</i> . The <i>metered market participant</i> assigns access to this data to the meter data associate (refer to ,).

2.4.3. Authorization Notification for a Service Provider

~~2.5. The IESO Notification of Participant Authorization~~

~~2.5.1. Authorization Notification for a Market Participant~~

~~After thenotifies Applicant Representatives offor prospective *market participants service providers who* 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.~~

~~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) 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), 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 page of the *IESO* website (refer also to the). The data that applicable Participants need to submit are described in greater detail in the .

Subject to certain caveats in the *market rules*, the *IESO* requires that *market* (MR Ch. 7 ss.2.1.1 and 2.2.1)

Market participants must register all their 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 and equipment to connect to the IESO-controlled grid. In some cases, a market participant will also register resources 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 for billing and effecting payment in respect of financial obligations or transactions into the day-ahead market at all virtual transaction zonal trading entities that are defined and maintained by the IESO; and processed by the IESO.

- *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 of this *market manual*.

3.1. Register Equipment Roles, Responsibilities and Relationships

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~~**Owner** role (refer to [section 2.2.3](#)) should review before starting the Register Equipment ~~procedure~~**procedures**.

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 will be required to 3)~~**must** complete an assessment and/or submit the applicable ~~requirements described in~~.

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

Table 1: Prerequisite Requirements for Register Equipment

Requirement	Description
Complete Connection Assessment and	As per the requirements of <u>Market Manual 1: Connecting to Ontario's Power System Part 1.4: Connection Assessment and Approval</u> , prospective and existing <i>market participants</i> and <i>embedded</i>

Requirement	Description
Approval ("CAA") Process	<p>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.</p> <p>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.</p> <p>For more information on the CAA process, refer to the Stage 2: Obtain conditional approval to connect page of the IESO website.</p>
Complete Participant Authorization Procedures	<p>Refer to section 2.</p> <p>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, 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.</p>
Prepare Single-Line Diagram	<p>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.</p> <p>Prior to submitting a Single-Line Diagram to the IESO, market participants shall confirm that the Single-Line Diagram:</p> <ul style="list-style-type: none"> • 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;

Requirement	Description
	<ul style="list-style-type: none"> • shows as built²² 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	<p>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.</p>
Prepare Operational Philosophy Document	<p>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.</p> <p>Variable generators must also provide a description of the power equipment and power curves. Refer to Appendix C: Wind Facility Data Requirements.</p> <p>The IESO provides a template of what is required in the operational philosophy document when registering a new facility.</p>
Obtain Technical Data	<p>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.</p>
Review Operational and Performance Requirements	<p>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.</p>

²² "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
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 <u>Market Manual 7: System Operations Part 7.8: Ontario Power System Restoration Plan (OPSRP)</u> , 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 <u>Market Manual 7: System Operations Part 7.8: Ontario Power System Restoration Plan, Section 13</u> .
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.
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.

3.1.2.3.1.1. 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 , this data may apply to some types of market participants and not others, and the IESO may require supporting documentation (refer to) to verify the data. Once the IESO reviews and approves the data, they are considered to be registered data with the IESO.~~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.

3.1.2. Facility Contacts

~~The Equipment Registration Specialist is also responsible for assigning~~Applicant Representative must assign specific *facility* contacts, where applicable, including:

- Operator High and Normal Priority, the 24/7 contact section responsible for operating equipment at the *facility* location; ~~and,~~
- ~~if applicable,~~Dispatch High and Normal Priority, the facility 24/7 contact section responsible for carrying out *dispatch instructions*; ~~and,~~
- the Facility Coordinator responsible for communications with the IESO about a facility during regular business hours.

3.1.3. Relationships

3.1.2.13.1.3.1 Market Participant/~~Equipment~~Facility Role Relationship

The key role relationships between a *market participant* and ~~equipment~~a facility are owner and operator~~, of the equipment within that facility,~~ as described in [section 2.2.3](#).

3.1.2.23.1.3.2 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~~single-line diagram in ~~Figure 3-1,~~ where a fictitious company GenCo owns a *generation facility* consisting of one combustion turbine (G1) and one steam turbine (G2) connecting to a common *connection point*.

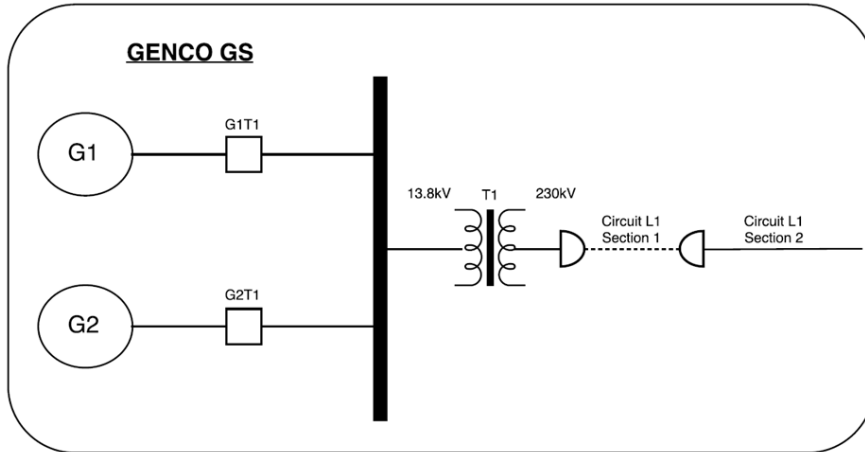


Figure 3-1: Single-Line Diagram Example

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). There may be a 'one-to-many' relationship between a connection point and a resource (i.e., oneOne 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 *load 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 *generation resource* associated with the same *connection point*. In other words, the *generation resource* must will 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*.

~~3.1.2.33.1.3.3~~ **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.~~

(MR Ch.7 ss.2.2.5 and 2.2.6)

Each *resource* may have role relationships with several different *market participants*. However, each role ~~relationship must~~may only be ~~unique. For example, if a~~unique. For example, if a ~~filled by one 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.~~filled by one 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 3-1 lists the role relationships that are assigned by the *market participant* for each *resource*.

Table 3-1: Market Participant/Resource Role Relationships

Role	Responsibility
Owner	<p>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.</p> <p>The owner is responsible for completing the Register Equipment procedures and assigning the <i>registered market participant</i>, <i>metered market participant</i> and operator role relationships to equipment or <i>resources</i> if applicable.</p> <p>The owner is also responsible for assigning an Equipment Registration Specialist as described in section 3.1.2.</p> <p><u>Refer to MR Ch.7 ss.2.2.6.1.</u></p>
Operator	<p>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.</p> <p><u>Refer to MR Ch.7 ss.2.2.6.1.</u></p>
Registered Market Participant	<p>The sole <i>market participant</i> responsible and authorized to submit <i>dispatch data</i> for the <i>resource</i> to which it has been assigned (Chapter 7, section 2.2.4 of the market rules).</p> <p>The <i>registered market participant</i> is also responsible for assigning <i>registered market participant</i> user-<i>resource</i> relationships that allow individual users to submit <i>dispatch data</i> for the assigned <i>resource</i>.</p> <p><u>Refer to MR Ch.7 ss.2.2.4.</u></p>

Role	Responsibility
Metered Market Participant	<p>The <i>market participant</i> responsible for the financial <i>settlement</i> with the <i>IESO</i> of all quantities of <i>physical services</i> at the relevant <i>delivery point</i> for the <i>resource</i> as part of the <i>settlement process</i>.</p> <p>The <i>metered market participant</i> assigns further relationships required for a <i>delivery point</i> as detailed in MM 3.8: Creating and Maintaining Delivery Point Relationships. Only one <i>metered market participant</i> may be assigned to each <i>delivery point</i>. The <i>metered market participant</i> assigned to the <i>day-ahead market</i> must be the same <i>metered market participant</i> assigned to the <i>real-time market</i>.</p> <p><i>Metered market participants</i> must contract with a <i>metering service provider</i> for their <i>metered resources</i>. The <i>metered market participant</i> assigns the <i>metering service provider</i> relationships to the <i>delivery point</i> for the <i>resource</i>. Each <i>delivery point</i> requires the assignment of a <i>metered market participant</i>.</p>
Metered Market Participant Transmission	<p>The <i>market participant</i> responsible for paying for one or more transmission services to a <i>transmitter</i> relating to an owned <i>facility</i>.</p>
Metering Service Provider	<p>Provides, installs, commissions, registers, maintains, repairs, replaces, inspects and tests <i>metering installations</i> associated with a <i>resource</i>.</p> <p>For more information, refer to MM 3.8: Creating and Maintaining Delivery Point Relationships.</p>
Meter Data Associate	<p>A service provider appointed by an <i>metered market participant</i> to access <i>metering data</i> pertaining to the <i>resource's delivery point</i>.</p> <p>For more information, refer to MM 3.8: Creating and Maintaining Delivery Point Relationships.</p>
Distributor	<p>The <i>market participant</i> that owns and operates at<u>the</u> <i>distribution system whereto which</i> the <i>facility</i> associated with a <i>resource</i> is <i>connected</i>.</p>
Transmitter	<p>The <i>market participant</i> that owns and operates at<u>the</u> <i>transmission system whereto which</i> the <i>facility</i> associated with a <i>resource</i> is <i>connected</i>. The <i>transmitter</i> may create a transmission network (TN) <i>resource</i> or a transmission connection (TC) <i>resource</i> for the <i>facility</i> for the purpose of collecting the applicable transmission tariff.</p>

Role	Responsibility
Market Control Entity	<p>The entity designated pursuant to Chapter 7, section 22.9 of the <i>market rules</i>. For organizations that do not have registered <i>market control entities</i> but are initiating the registration process for a <i>resource offer</i> or <i>bid</i> type that necessitates a <i>market control entity</i>, the <i>market participant</i> shall disclose their respective <i>market control entities</i> via the Update Organization process according to the requirements set out in Chapter 7, section 22.9 of the <i>market rules</i>.</p>
Market Control Entity for Physical Withholding	<p>The entity designated pursuant to Chapter 7, section 22.9 of the <i>market rules</i>. For organizations that do not have registered <i>market control entities for physical withholding</i>, but are initiating the registration process for a <i>resource offer</i> or <i>bid</i> type that necessitates a <i>market control entity for physical withholding</i>, the <i>market participant</i> shall disclose their respective <i>market control entities</i> via the Update Organization process according to the requirements as set out in Chapter 7, section 22.9 of the <i>market rules</i>.</p> <p>Applicable <i>market participants</i> are required to select a <i>market control entity for physical withholding</i> for the following <i>resources</i> during the Register Equipment process according to the requirements set out in section 22.9 of Chapter 7:</p> <ul style="list-style-type: none"> • <i>dispatchable generation resource;</i> • <i>dispatchable load resource</i> authorized to participate in <i>operating reserve;</i> • <i>dispatchable generation resources at a dispatchable electricity storage facility;</i> and • <i>dispatchable loads at a dispatchable electricity storage facility.</i>

3.2. ~~Registering Facility, Registration of Facilities and Equipment, and Resource Data~~

To complete the Register Equipment procedure, the ~~(MR Ch.7 ss.2.1.1.2, 2.1.1.7 and 2.2)~~

~~The Equipment Registration Specialist might need to submit certain supporting documents~~ must provide the IESO with *facility* and equipment data (as described in) via Online IESO. 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*.

~~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 . Through the *facility* and equipment registration activities, the associated *resource(s)* will be established. 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 [3.8](#) identify ~~additional~~the *resource* registration data that the *IESO* may require depending on the ~~*facility* and~~*resource* participation type.

3.2.1. Assessment Requirements

~~Prospective and existing *market participants* and *embedded market participants* must sufficiently complete the Connection Assessment and Approval (“**CAA**”) Process as described in [MM 1.4: Connection Assessment and Approval](#). During this process, they will:~~

- ~~• receive a Notification of Conditional Approval to Connect from the *IESO*; and~~
- ~~• confirm with the *IESO* the number of *resources* required at their *facility*.~~

~~This information must be provided during the Register Equipment process.~~

3.2.2. Submission Requirements

~~(MR Ch.7 ss.2.1.1, 2.2.1, 2.2.3 and 2.2.6)~~

~~The *facility* owner must submit the applicable data and documentation described in [Table 3-2](#).~~

Table 3-2: Submission Requirements for Register Equipment

<u>Submission Requirement</u>	<u>Description</u>
<u>Notification of Conditional Approval to Connect</u>	<u>Approval received during the Connection Assessment and Approval Process.</u>

<u>Submission Requirement</u>	<u>Description</u>
<u>Single-Line Diagram</u>	<p><u>Each <i>market participant</i> must provide a station electrical diagram showing the new or modified <i>facility</i> and its connection path to the <i>IESO-controlled grid</i>.</u></p> <p><u>The Single-Line Diagram must:</u></p> <ul style="list-style-type: none"> <u>• be accepted by their <i>transmitter</i> or <i>distributor</i>;</u> <u>• contains the appropriate approved operating nomenclature that is used by the <i>market participant's transmitter</i>, and not the engineering nomenclature;</u> <u>• shows the electrical equipment at the <i>facility</i> and the <i>connection points to the grid</i>;</u> <u>• shows as-built²³ data approved for construction, and marked with an Ontario Professional Engineer's seal;</u> <u>• clearly references the <i>market participant's name</i>, and the <i>facility name</i> to be registered in Online IESO;</u> <u>• be annotated with data monitoring information, including the location of the <i>Dynamic Disturbance Recorder</i> and/or equivalent; and</u> <u>• have enough detail to allow the <i>IESO</i> to implement modelling changes in <i>IESO</i> systems and tools.</u> <p><u>A Single-Line Diagram is required for all <i>facilities</i> being registered for participation in the <i>IESO-administered markets</i>, and are submitted via Online IESO.</u></p>
<u>Protection Description Document</u>	<p><u><i>Market participants</i> 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 <i>facility</i>. The <i>Protection Description Document</i> includes local and remote estimated design fault clearing times, a tripping matrix, and (where applicable), describes the separation of redundant protection groups.</u></p> <p><u>The <i>IESO</i> can provide a template upon request.</u></p>
<u>Operational Philosophy Document</u>	<p><u><i>Market participants</i> must prepare a document attesting to their <i>facilities'</i> operating conditions and limitations (e.g., common mode failures, high/low temperatures, high/low wind speed) and procedures for <i>planned</i> and <i>forced outages</i>, returning equipment to service, responding to <i>IESO</i> directives within five minutes, and training staff on <i>IESO</i> interaction.</u></p>

²³ "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.

<u>Submission Requirement</u>	<u>Description</u>
	<p><i>Facilities that have variable generation resources must also provide a description of the power equipment and power curves. Refer to Appendix C: Wind Facility Data Requirements.</i></p> <p><i>The IESO provides a template of what is required in the operational philosophy document when registering a new facility.</i></p>
<u>Technical Equipment Data</u>	<p><i>The Register Equipment procedures in Online IESO will require market participants to submit technical data for equipment and, where applicable, supporting documentation. This data and supporting information will be reviewed and approved by the IESO. Technical data is described in the Register Equipment Help File.</i></p> <p><i>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.</i></p>
<u>Review Operational and Performance Requirements</u>	<p><i>The technical requirements and associated performance standards for each type of facility are stated in the market rules (refer to Appendix B) and in MM 6: Participant Technical Reference Manual.</i></p>
<u>Execute Connection Agreement</u>	<p><i>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).</i></p>
<u>Prepare Restoration Participant Attachment</u>	<p><i>Based on the criteria contained in MM 7.8: Ontario Power System Restoration Plan ss.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.</i></p> <p><i>Restoration participants are required to submit a Restoration Participant Attachment via Online IESO as outlined in MM 7.8 ss.13.</i></p>
<u>Prepare Facility Description Document</u>	<p><i>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.</i></p> <p><i>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</i></p>

<u>Submission Requirement</u>	<u>Description</u>
	<u>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.</u>
<u>Other Supporting Documentation</u>	<u>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.</u>

3.2.1.3.2.3. Metering Requirements

(MR Ch.9 ss.2.1.2)

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 MM 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 4.1.5](#)) and the IESO has issued a RAN via Online IESO.

3.2.2.3.2.4. Data Monitoring Requirements

- (MR Ch.2 ss.6 and App.2.2, MR Ch.4 ss.5)

All *facilities* must comply with the applicable data monitoring requirements, which are listed in the [MR Ch.4 Appendices](#). Data monitor testing is explained in [section 3.2.5.3](#).

3.2.3.3.2.5. Market Rule Exemptions

(~~Market Rules: Chapter MR Ch.1, section ss.14~~)

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

3.2.4.3.2.6. Facility Registration Status

- (MR Ch.2 ss.3.1.5 and MR Ch.7 ss.2.1.1)

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.

~~The *IESO* issues a RAN to communicate the completion of specific Register Equipment activities. It can be either final or conditional. A Register Equipment change is not considered to be officially registered when the Equipment Registration Specialist receives a final RAN email from verifying that the equipment change is completed and is registered with until the *IESO*. A new facility cannot participate in the *IESO* administered markets nor cause or permit issues a final RAN.~~

3.2.6.1 Conditional RANs

(MR Ch.2 ss.4.1)

~~A conditional RAN is issued to allow a *commissioning generation facility* to convey electricity or any physical service to be conveyed into, through or out of the *integrated power system* unless a RAN has been issued by *IESO-controlled grid* during the time the *facility* is undergoing commissioning tests. It contains a list of requirements that must be completed prior to the *IESO*-specified expiry date in order for a *facility* to qualify for a final RAN.~~

3.2.4.1 Interim RANs

~~Prior to issuing the final RAN, the *The IESO* may issue interim RANs that allow certain register equipment change milestones to proceed one or more conditional RANs during the registration process before issuing a final RAN. For example, for an equipment change involving a new *facility*, an interim conditional RAN may be issued to allow the new *facility* to:~~

- connect and energize on potential only;
- connect and withdraw as a load; or
- ~~connect and energize as a load facility; or~~
- ~~connect~~/or generate for commissioning purposes.

The *IESO* Market Registration Specialist assigned to the Register Equipment change ~~can provide assistance/guidance on when an interim will determine when a conditional RAN is needed appropriate. A conditional RAN may impose restrictions on a *facility*~~

while the RAN is in effect, such as the *facility's* output being limited to a specified maximum MW value.

3.2.4.23.2.6.2 RAN Extensions

(MR Ch.2 ss.4.1)

A RAN may include conditions that ~~are mandatory and~~ must be met by an expiry date. If a condition cannot be met by the expiry date due to circumstances beyond the ~~Participant's~~market participant's or program 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.

3.2.6.3 Conditional RAN Expiration and Renewal

(MR Ch.2 ss.4.2)

If a conditional RAN is suspended, terminated or lapses, the RAN may be renewed by having the Equipment Registration Specialist submit a request with a new plan for completing all the requirements in the suspended, terminated or lapsed conditional RAN that is acceptable to the IESO.

When a conditional RAN is suspended or terminated or lapses, the new or modified equipment must be immediately switched to off-line and any associated dispatch data must be removed, until such time as the suspension is lifted or a new conditional RAN is issued by the IESO.

3.2.6.4 Final RAN

(MR Ch.2 ss.4.2)

A Register Equipment change is complete and the equipment registered with the IESO when the Equipment Registration Specialist receives a final RAN email from Online IESO.

3.2.5.3.2.7. Participant and Facility Testing

(~~Market Rules: Chapter MR Ch.2, section ss.6, Appendix and App.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-market participant, program participant or service provider. In order to complete the Register Equipment procedures, all ~~Participant and facility~~ tests must be verified and approved by the *IESO*.

Important: ParticipantsMarket participants, program participants and service providers 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~~ Appropriate employee training and procedures must be in place to ensure ~~they~~ staff are prepared for participation in the *IESO-administered markets* as soon as ~~they are the market participant, program participant or service provider is~~ authorized.

~~3.2.5.13.2.7.1~~ **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 (PTRM)-MM 6~~ **ss.2.**

Market participants are required to test and confirm that their *participant workstation* is functional ~~and~~ can interoperate and can 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~~ gateway.

~~3.2.5.23.2.7.2~~ **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 ~~section~~ **MM 6 ss.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.

~~3.2.5.33.2.7.3~~ **Data Monitor Testing**

Real-time data monitoring (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 MR Ch. 4, sections App.4.15 through 4.18** specifies the points required and **Sections MR Ch.4 App.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.

~~3.2.6. Requirements for Market Power Mitigation~~

~~This section describes the reference levels and reference quantities that the IESO will register for the applicable dispatch data.~~

~~3.2.6.1 Reference Levels for Financial Dispatch Data Parameters~~

~~The IESO will determine reference levels for financial dispatch data parameters that will be used in conduct and impact testing when conditions for market power exist.~~

~~For more information on the process to establish reference levels for financial dispatch data, refer to . lists the applicable reference levels for financial dispatch data parameters registered by resource type.~~

Table 1: Applicability of Financial Reference Levels to a Dispatchable Resource's Technology Type

Energy Offer Reference Level	Speed-No-Load Reference Level	Start-Up Reference Level	Operating Reserve Offer Reference Level
<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) • Variable generation resource (i.e., Wind and Solar) • Dispatchable hydroelectric generation resource • Dispatchable non-quick start generation resource (nuclear) • Dispatchable quick-start generation resource (non-hydroelectric) 	<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) 	<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) 	<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) • Dispatchable hydroelectric generation resource • Dispatchable load • Dispatchable quick-start generation resource (other than hydroelectric)

~~3.2.6.2 Reference Levels for Non-Financial Dispatch Data Parameters~~

~~The IESO will determine reference levels for non-financial dispatch data parameters that will be used to validate non-financial dispatch data parameters submitted by market participants before the dispatch data is used by the day-ahead market calculation engine, the pre-dispatch calculation engine, or the real-time calculation engine to determine schedules and prices. lists the set of reference levels that are registered for non-financial dispatch data parameters as applicable by the technology type of the resource. For more information on the process to establish reference levels for non-financial dispatch data parameters, refer to .~~

~~3.2.6.31.1.1.1~~ **Table 1: Reference Levels for Non-Financial Dispatch Data Parameters**

Non-Financial Reference Level	Applicable Resources
Energy Ramp Rate Reference Level	<ul style="list-style-type: none"> Dispatchable generation resources Dispatchable quick start generation resource (other than hydroelectric)
Operating Reserve Ramp Rate Reference Level ²⁴	<ul style="list-style-type: none"> Dispatchable generation resources Dispatchable load Dispatchable quick start generation resource (other than hydroelectric)
Lead Time Reference Level (Hot, Warm and Cold)	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)
Minimum Loading Point Reference Level	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)
Minimum Generation Block Run Time Reference Level	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)
Minimum Generation Block Down Time Reference Level (Hot, Warm And Cold)	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)
Maximum Number Of Starts per Day Reference Level	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear) Dispatchable hydroelectric generation resources
Ramp Up Energy To MLP Reference Level (Hot, Warm and Cold)	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)
Ramp Hours To MLP Reference Level (Hot, Warm and Cold)	<ul style="list-style-type: none"> Dispatchable non-quick start generation resource (non-nuclear)

²⁴A single *operating reserve ramp rate reference level* is registered that will be used to validate all applicable classes of *operating reserve ramp rates dispatch data* submission.

3.2.6.4 Reference Quantities

The IESO will determine *reference quantities* for each resource that will be used in the ex-post market power mitigation assessment for physical withholding.

For more information on *reference quantities*, refer to ~~Table 3-3~~ lists the applicable *reference quantities* by *resource* type.

Table 3-3: Applicability of Reference Quantities to a Dispatchable Resource's Technology Type

Energy	Operating Reserve
<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) • Variable generation resource (i.e., Wind and Solar) • Dispatchable hydroelectric generation resource • Dispatchable non-quick start generation resource (nuclear) • Dispatchable quick start generation resource (non-hydroelectric) 	<ul style="list-style-type: none"> • Dispatchable non-quick start generation resource (non-nuclear) • Dispatchable hydroelectric generation resource • Dispatchable load • Dispatchable quick start generation resource (non-hydroelectric)

3.3. Registration Requirements of Resources for Generators

(Market Rules: Chapter (MR Ch.7, sections ss.2.1 and 2.2)

To participate in the IESO-administered markets, market participants authorized as generators ~~are required to~~ **must** register one or more *resources* for each *generation facility*. How ~~generation~~ **these** *resources* participate in the IESO-administered market varies by the ~~groupings~~ **classifications** 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
<i>Dispatchable</i>	<i>Dispatchable non-quick start generation resource (nuclear)</i>
	<i>Dispatchable non-quick start generation resource (non-nuclear)</i>
	<i>Variable generation resource</i>
	<i>Dispatchable hydroelectric generation resource</i>
	<i>Dispatchable electricity storage resource</i>
<i>Self-scheduling generator</i>	<i>Self-scheduling generation resource</i>
<i>Intermittent generator</i>	<i>Intermittent generation resource</i>

The *bid/offer* type is a mandatory field that indicates whether a registered *generation resource* is either a *dispatchable generation resource*, a *self-scheduling generation resource* or an *intermittent generation resource*. 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*.

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~~ 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 3-4: Resource Data Parameter Requirements₇ by Generation Resources Classification

Resource Data Parameter	Section - Market Manual 1.5	Mandatory/Optional/ by IESO	Generation Resource Classification									
			Dispatchable									Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facilityplant)	Steam Turbine Resource (combined cycle facilityplant)	Pseudo-unit (combined cycle facilityplant)	Variable Generation	Hydroelectric	Quick-start (non-hydroelectric) Electricity storage	Self-scheduling ₇ Transitional and Intermittent	
Bid/Offer Type	3.3.1	M	X	X	X	X		X	X	X	X	
Operating Reserve Class	3.3.1.1	M	X	X	X	X			X	X		
Quick Start Flag Market Control Entity for Physical Withholding	3.3.1.2	M	X	X	X	X	X	X	X	X	X	
Quick Start Flag	3.3.1.3	M	X	X	X	X		X	X	X	X	
Number of Forbidden Regions	3.3.32.1	O							X			

Registration Data Parameter	Section of MM1.5	Mandatory/Optional/ by IESO	Generation Resource Classification										
			Dispatchable										Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facilityplant)	Steam Turbine Resource (combined cycle facilityplant)	Pseudo-unit (combined cycle facilityplant)	Variable Generation	Hydroelectric	Quick-start (non-hydroelectric) Electricity storage	Self-scheduling, Transitional and Intermittent		
Start Indication Value	3.3.3.2.2	0								X			
Hourly Must Run Flag	3.3.3.3.3	0								X			
Shared Daily Energy Limits	3.3.3.4	⊖								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		
Period of Steady Operation	3.3.4.2	M		X	X	X							

Resource Data Parameter	Section - Market Manual 1.5	Mandatory/Optional/ by IESO	Generation Resource Classification									
			Dispatchable									Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facilityplant)	Steam Turbine Resource (combined cycle facilityplant)	Pseudo-unit (combined cycle facilityplant)	Variable Generation	Hydroelectric	Quick-start (non-hydroelectric) Electricity storage	Self-scheduling, Transitional and Intermittent	
Minimum Loading Point	3.3.43.3	M		X	X							
Minimum Generation Block Run Time	3.3.3.4.4	M		X	X	X						
Pseudo-Unit Modelling Election Flag	3.3.54.1	O			X	X						
Steam Turbine Minimum Loading Point	3.3.54.2	O				X						
Steam Turbine Percentage Share	3.3.54.3	M					X					

Resource Data Parameter	Section - Market Manual 1.5	Mandatory/Optional/ by IESO	Generation Resource Classification									
			Dispatchable									Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facilityplant)	Steam Turbine Resource (combined cycle facilityplant)	Pseudo-unit (combined cycle facilityplant)	Variable Generation	Hydroelectric	Quick-start (non-hydroelectric) Electricity storage	Self-scheduling, Transitional and Intermittent	
Steam Turbine Duct Firing Capacity	3.3.54.4	by IESO				X						
Duct Firing 10 Ten-Minute Operating Reserve Flag	3.3.4.5					X						
Reference Levels for Financial Dispatch Data	3.3.1.4	M	X	X	X	X	X	X	X	X		
Reference Levels for Non-Financial Dispatch Data	3.3.1.5	M	X	X	X	X	X	X	X	X		

Resource Data Parameter	Section - Market Manual 1.5	Mandatory/Optional/ by IESO	Generation Resource Classification									
			Dispatchable									Non-Dispatchable
			Non-quick start (Nuclear)	Non-quick start (non-nuclear)	Combustion Turbine Resource (combined cycle facilityplant)	Steam Turbine Resource (combined cycle facilityplant)	Pseudo-unit (combined cycle facilityplant)	Variable Generation	Hydroelectric	Quick-start (non-hydroelectric) Electricity storage	Self-scheduling, Transitional and Intermittent	
Reference Quantities	3.3.1.6	M	X	X	X	X	X	X	X	X		

3.3.1. General Generation Resource Registration Requirements

3.3.1.1 Operating Reserve Class

~~(Market Rules: Chapter 7, section (MR Ch.7 ss.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*.

3.3.1.2 Market Control Entity for Physical Withholding

~~(MR Ch.7 ss.22.9)~~

~~Market participants disclose their market control entities and then select a market control entity for physical withholding from among their market control entities for each of their dispatchable generation resources via the Update Organization process.~~

~~3.3.1.2~~ **3.3.1.3 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 Table 3-4. 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~~*ten-minute operating reserve* when their

breaker is open. The *settlement process* also uses the value set for this parameter to determine *generation offer guarantee (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 **No**. 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*.

3.3.1.4 Reference Levels for Financial Dispatch Data Parameters

(MR Ch.7 ss.22.1.1 and 22.2.1)

Table 3-5 lists the *resource* types that have *reference levels* registered for each *financial dispatch data parameter*. For more information on the process the *IESO* uses to determine *reference levels* for *financial dispatch data parameters*, refer to [MM 14.2: Reference Level and Reference Quantity Procedures](#).

Table 3-5: Applicability of Financial Reference Levels by Resource Technology Type

<u>Energy Offer Reference Level</u>	<u>Speed No-Load Reference Level</u>	<u>Start-Up Reference Level</u>	<u>Operating Reserve Offer Reference Level</u>
<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> • <u><i>Variable generation resource (i.e., wind and solar)</i></u> • <u><i>Dispatchable hydroelectric generation resource</i></u> • <u><i>Dispatchable non-quick start generation resource (nuclear)</i></u> • <u><i>Dispatchable electricity storage resource</i></u> 	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> 	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> 	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> • <u><i>Dispatchable hydroelectric generation resource</i></u> • <u><i>Dispatchable load</i></u> • <u><i>Dispatchable electricity storage resource</i></u>

3.3.1.5 Reference Levels for Non-Financial Dispatch Data Parameters

(MR Ch.7 ss.22.1.1 and 22.3.1)

Resources have two sets of reference levels for non-financial dispatch data registered, one each for:

- the summer period, which is from May 1 to October 31; and
- the winter period, which is from November 1 to April 30.

Certain reference levels for non-financial dispatch data parameters are also registered for each thermal state (hot, warm, and cold) of a resource.

Table 3-6 sets out the resource types that have reference levels registered for each non-financial dispatch data parameter. For more information on the process the IESO uses to determine reference levels for non-financial dispatch data parameters, refer to MM 14.2: Reference Level and Reference Quantity Procedures.

Table 3-6: Reference Levels for Non-Financial Dispatch Data Parameters

<u>Non-Financial Reference Level</u>	<u>Registered for the Following Resource Types</u>
<u>Energy Ramp Rate Reference Level</u>	<ul style="list-style-type: none"> • <u>Dispatchable generation resources</u> • <u>Dispatchable electricity storage resource</u>
<u>Operating Reserve Ramp Rate Reference Level²⁵</u>	<ul style="list-style-type: none"> • <u>Dispatchable generation resources</u> • <u>Dispatchable load</u> • <u>Dispatchable electricity storage resource</u>
<u>Lead Time Reference Level (for each thermal state)</u>	<ul style="list-style-type: none"> • <u>Dispatchable non-quick start generation resource (non-nuclear)</u>
<u>Minimum Loading Point Reference Level</u>	<ul style="list-style-type: none"> • <u>Dispatchable non-quick start generation resource (non-nuclear)</u>
<u>Minimum Generation Block Run-Time Reference Level</u>	<ul style="list-style-type: none"> • <u>Dispatchable non-quick start generation resource (non-nuclear)</u>
<u>Minimum Generation Block Down Time Reference Level (for each thermal state)</u>	<ul style="list-style-type: none"> • <u>Dispatchable non-quick start generation resource (non-nuclear)</u>
<u>Maximum Number Of Starts per Day Reference Level</u>	<ul style="list-style-type: none"> • <u>Dispatchable non-quick start generation resource (non-nuclear)</u> • <u>Dispatchable hydroelectric generation resources</u>

²⁵ A single operating reserve ramp rate reference level is registered that will be used to validate all applicable classes of operating reserve ramp rates dispatch data submission.

<u>Non-Financial Reference Level</u>	<u>Registered for the Following Resource Types</u>
<u>Energy Per Ramp Hour Reference Level (for each <i>thermal state</i>)</u>	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u>
<u>Ramp Hours To MLP Reference Level (for each <i>thermal state</i>)</u>	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u>

3.3.1.6 Reference Quantities

(MR Ch.7 ss.22.6.1)

Table 3-7 lists the *resource types* that will have *reference quantities* registered in the *energy and/or operating reserve markets*. The *IESO* registers sets of *reference quantities* for each market in which a *resource* participates. For more information on the process the *IESO* uses to determine *reference quantities* and calculate *reference quantity values*, refer to [MM 14.2: Reference Level and Reference Quantity Procedures](#).

Table 3-7: Reference Quantities by Technology Type and Market

<u>Energy Market</u>	<u>Operating Reserve Market</u>
<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> • <u><i>Variable generation resource (i.e., wind and solar)</i></u> • <u><i>Dispatchable hydroelectric generation resource</i></u> • <u><i>Dispatchable non-quick start generation resource (nuclear)</i></u> • <u><i>Dispatchable electricity storage resource</i></u> 	<ul style="list-style-type: none"> • <u><i>Dispatchable non-quick start generation resource (non-nuclear)</i></u> • <u><i>Dispatchable hydroelectric generation resource</i></u> • <u><i>Dispatchable load</i></u> • <u><i>Dispatchable electricity storage resource</i></u>

3.3.2. Dispatchable Hydroelectric Generation Resource Registration Requirements

(MR Ch.7 ss.2.2.6A)

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.

3.3.2.1 Number of Forbidden Regions

(~~Market Rules: Chapter MR Ch.7, sections ss.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~~ *the forbidden regions* 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~~ The Equipment Registration Specialist may register up to five *forbidden regions* meet for each eligible *resource* in accordance with the following ~~criteria~~ requirements:

- *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 **MR Ch.7**, section **ss.2.2.6E** of the *market rules*~~).

3.3.2.2 Start Indication Value

(~~Market Rules: Chapter **MR Ch.7**, sections **ss.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 unique, 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.~~

3.3.2.3 Hourly Must Run Flag

(~~Market Rules: Chapter **MR Ch.7**, sections **ss.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*.~~ The Equipment Registration Specialist may optionally submit the *hourly must run flag* parameter for each *dispatchable hydroelectric generation resource*.

~~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**. 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 *IESO* registers the *hourly must run* flag after its review of submitted values and supporting technical documentation.

3.3.2.4 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.

3.3.2.5 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.

3.3.3. Dispatchable Non-Quick Start Generation Resources

This section applies to *dispatchable non-quick start generation resources* with a primary fuel type of **Bio Fuel, Gas, Oil or Steam** 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:

- a *dispatchable non-quick start generation resource* associated with a *generation unit* that has a primary or alternate fuel type value other than **Uranium**; and
- 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* for each resource must submit/register the start-up offer and speed no-load offer eligibility flag in Online IESO as 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/eligibility flag 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 resource at a

combined cycle ~~generation resource~~plant and subject to registration of the *resource* data parameters indicated in [section 3.3.5](#) of this *market manual*.

3.3.3.1 Elapsed Time to Dispatch

(~~Market Rules: Chapter MR Ch.7, section ss.2.2.6K.1~~)

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~~*minimum loading point*. 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~~*generation offer guarantee* 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.

3.3.3.2 Period of Steady Operation

(~~Market Rules: Chapter MR Ch.7, section ss.2.2.6H6K.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.

3.3.3.3 Minimum Loading Point

~~(Market Rules: Chapter MR Ch.7, section ss.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 minimum loading point* registration parameter to approve the *MLP minimum loading point* submitted as *daily dispatch data* by the *registered market participant*. The IESO also uses the registered *MLP minimum loading point* to determine the *GOG-eligibility* for a *resource*.

The Equipment Registration Specialist submits a single *MLP minimum loading point* for each eligible *resource* by providing a value in MW. Supporting technical documentation that demonstrates the *MLP minimum loading point* for each *resource* must also be provided. The value 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 minimum loading point* after its review of submitted values and supporting technical documentation.

If a *resource* is part of a *combined cycle generation resource plant* 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 minimum loading point*. Submission of the *MLP minimum loading point* for a steam turbine is described in [section 3.3.5.2](#) of this *market manual*.

3.3.3.4 Minimum Generation Block Run Time

~~(Market Rules: Chapter MR Ch.7, section ss.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 minimum loading point*. 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 generation offer guarantee* 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.

3.3.4. Combined Cycle ~~Facility~~Plant

~~(Market Rules: Chapter MR Ch. 7, sections ss. 2.2.6G)~~

~~This section applies to a combined cycle plant whose generation units are represented as individual resources and it does not have physically aggregated resources. Aggregation is explained in section 4.6 of this market manual.~~

~~A combined cycle facility is a plant is a group of generation resources associated with 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 facilityplant in the day-ahead market and real-time market allows generators to offer their dependentinterdependent 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 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 MR Ch. 7, section ss. 2.2.6G of the market rules to submit all mandatory resource data parameters specific to a combined cycle facilityplant 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 facilityplant 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](#).~~

3.3.4.1 Combustion and Steam Turbine Configuration Relationships – Pseudo-Unit Modeling/Modelling

Potential *dispatch* configuration relationships between combustion turbine *resources* and a steam turbine *resource* at a *combined cycle facilityplant* 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 minimum loading point* 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 facilityplant*. 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.

The registration of a *pseudo-unit* is completed only when the IESO approves the request. Approval is determined using the steam turbine utilization supporting document. This document identifies how steam is used at the *combined cycle plant* and must be submitted by the Equipment Registration Specialist at time of *pseudo-unit* registration in Online IESO. The IESO will approve *pseudo-unit* requests if it determines that the proposed *pseudo-unit* will be able to comply with *dispatch instructions* and not impact the *security of the IESO-controlled grid*.

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 facilityplant* (refer to Figure 3-2).

Combined cycle relationship data for a *combined cycle facilityplant* 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 generation offer guarantee* settlement of *pseudo-unit-units* 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 facilityplant* 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 *resources* registered to the *combined cycle facilityplant*;
- each *pseudo-unit* will have a unique combustion turbine *resource*;
- all combustion turbine *resources* at a *combined cycle facilityplant* 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 facilityplant* relationships and *resource* data parameter requirements are summarized in [Figure 3-3](#).

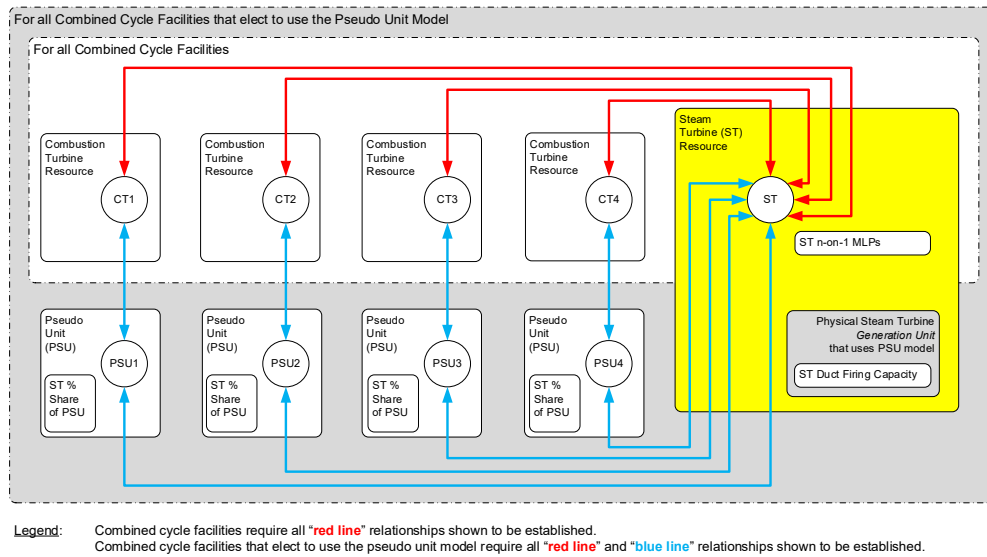


Figure 3-2: Combined Cycle FacilityPlant Relationships and Resource Data Parameter Requirements

3.3.4.2 Steam Turbine Minimum Loading Point

The steam turbine *minimum loading point* (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 facilityplant* 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 1one or more combustion turbines are associated with the steam turbine;
- steam turbine MLP (2 on 1) – when 2two or more combustion turbines are associated with the steam turbine;
- steam turbine MLP (3 on 1) – when 3three or more in-service combustion turbines are associated with the steam turbine;
- steam turbine MLP (4 on 1) – when 4four 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 facilityplant*;
- number format xxxx.x – unit is MW; and

- $0 < \text{MLP}(i-1)\text{-on-1} < \text{MLP}(i)\text{-on-1} \leq \text{MGC}$,
- 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 combined cycle plant* configuration. The “ i ” is defined as a variable $2 \leq i \leq n$, where “ n ” is the number of combustion turbines at the *combined cycle facility plant*.

3.3.4.3 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 plant*.

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) \geq (MLP for a 1 combustion turbine to 1 steam turbine relationship).

3.3.4.4 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 facilityplant*;
- number format xxxx.x – unit is MW; and
- $0 \leq \text{Duct Firing} \leq \text{ST MGC} - [(\text{Registered Number of Combustion Turbines at a Combined Cycle Plant}) * (\text{Registered ST MLP1-on-1})]$

3.3.4.5 Duct Firing ~~10~~Ten-Minute Operating Reserve Capability Flag

The *duct firing ~~10~~ten-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~~ten-minute synchronized or ~~10~~ten-minute non-synchronized *operating reserve*. This parameter can be used to prevent steam turbine *resources* associated with a *pseudo-unit* from receiving ~~10~~ten-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 ~~parameter~~parameter 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. This value may only be submitted if the registered steam turbine duct firing capacity is > 0 MW. A value of **No** indicates the *pseudo-unit* may not be scheduled by the *IESO* for ten-minute synchronized or ten-minute non-synchronized *operating reserve* in the duct firing region.

3.3.5. Requirements for Generator Offer Guarantee Status

- [\(MR Ch.7 ss.2.2.27 and MR Ch.9 ss.\[*\]\)](#)

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

A *resource* is eligible for the [GOG generation offer guarantee](#) 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~~ [MLPa minimum loading point](#) 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 generation offer guarantee](#) election flag *resource* data parameter to request the [GOG generation offer guarantee](#) status in the *day-ahead market* and *real-time market*.

Upon receipt, the *IESO* processes [GOG generation offer guarantee](#) 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 generation offer guarantee](#) *resource* data parameter to all eligible *resources*.

3.4. Registration [Requirements of Resources](#) for Wholesale Consumers

~~(Market Rules: Chapter (MR Ch.7, sections ss.2.1, 2.2.1, 2.2.2, 2.2.3, 2.2.5, 2.2.6 (as applicable,) and 2.2.8)~~

Wholesale consumers may participate in the *IESO-administered markets* using a *load resource* with one of the classifications specified in Table 3-8. 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 3-8: Classification for Load Resources

Bid/Offer Type	Load Resource Classification
Dispatchable	<ul style="list-style-type: none"> • Dispatchable load • Hourly demand response resource
Non-dispatchable	Non-dispatchable load

Bid/Offer Type	Load Resource Classification
	<ul style="list-style-type: none"> Hourly demand response resource
Day- Ahead ahead price responsive	<ul style="list-style-type: none"> 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 3-9 and are used by the *IESO* tools and processes to support *dispatch data* validation, scheduling and *dispatch* decisions and *settlement*.

Table 3-9: 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		
<u>Market Control Entity for Physical Withholding</u>	<u>M</u>		<u>X</u>		
Maximum Registered Dispatchable or Price Responsive Load capacity	by <i>IESO</i>		X	X	
<u>Reference Levels for Financial Dispatch Data</u>	<u>M</u>		<u>X</u>		
<u>Reference Levels for Non-Financial Dispatch Data</u>	<u>M</u>		<u>X</u>		
<u>Reference Quantities</u>	<u>M</u>		<u>X</u>		

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*.

3.4.1.1 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.

3.4.1.2 Operating Reserve

~~(Market Rules: Chapter MR Ch.7, sections ss.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 34.5.2.1](#) 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*.

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 operating reserve* and *thirty-minute operating reserve market* as described in Table 3-10.

Table 3-10: 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)	<p>This criterion allows the <i>IESO</i> to make assumptions about the availability and consumption level of the <i>load resource</i>. A lower duty ratio means that the <i>IESO</i> has to carry more <i>ten-minute operating reserve</i> or <i>thirty-minute operating reserve</i> or <i>regulation</i> to compensate for a higher uncertainty of the ability of the <i>load resource</i> to comply with the <i>ten-minute operating reserve</i> or <i>thirty-minute operating reserve</i> activation request.</p> <p>This also limits the exposure of that <i>load resource</i> in the event it's scheduled for <i>ten-minute operating reserve</i> or <i>thirty-minute operating reserve</i> but is not able to activate because it would be down 10 or 30 minutes after receipt of the activation message.</p> <p>For instance, for <i>ten-minute non-spinning operating reserve</i>, if a <i>load resource</i> 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.</p>
2	Must not be at zero consumption for more than 10 minutes at a	<p>This criterion is required to help ensure that the <i>load resource</i> will be able to respond to a <i>ten-minute operating reserve</i> activation and reduce consumption within 10 minutes (i.e., the</p>

Criteria		Rationale
	time (exceptions are allowed for unplanned events)	<i>resource</i> would have been loaded at the time the relief is required).
3	Must not be at zero consumption for more than 30 10 minutes at a time (exceptions are allowed for unplanned events)	This criterion is required to help ensure that the <i>load resource</i> will be able to respond to a <i>thirty-minute operating reserve</i> activation and reduce consumption within 30 minutes (i.e., the <i>resource</i> 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 ten-minute <i>operating reserve</i> or <i>thirty-minute operating reserve</i>	As described in <i>NPCC Directory 5 Reserve</i> .
5	Must be able to respond to the <i>IESO's</i> activation request for 10 ten-minute <i>operating reserve</i> and reduce load within 10 minutes	As described in: <ul style="list-style-type: none"> <i>IESO market rules</i>, definitions of 10ten-minute <i>operating reserve</i> and 30thirty-minute <i>operating reserve</i> <i>NERC Glossary of Terms</i>
6	Must be able to respond to the <i>IESO's</i> activation request for 30 thirty-minute <i>operating reserve</i> and reduce load within 30 minutes	As described in: <ul style="list-style-type: none"> <i>IESO market rules</i>, definitions of 10ten-minute and 30thirty-minute reserve <i>NERC Glossary of Terms</i>

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.

3.4.1.3 Market Control Entity for Physical Withholding

(MR Ch.7 ss.22.9)

Market participants disclose their market control entities and then select a market control entity for physical withholding from among their market control entities for each of their dispatchable load resources via the Update Organization process.

3.4.1.4 Maximum Registered Dispatchable or Price Responsive Load – Active Power

The maximum ~~registered dispatchable or price responsive load~~ load – active power 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 a *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 Total peak load – Active Power values provided by the Equipment Registration Specialist for all registered *loads* associated with the *load resource*.

3.4.1.5 Reference Levels for Financial Dispatch Data Parameters

(MR Ch.7 ss.22.1.1 and 22.2.1)

Table 3-11 lists the *resource types* that have *reference levels* registered for each *financial dispatch data parameter*. For more information on the process the IESO uses to determine *reference levels* for *financial dispatch data parameters*, refer to [MM 14.2: Reference Level and Reference Quantity Procedures](#).

Table 3-11: Applicability of Financial Reference Levels by Resource Type

<u>Energy Offer Reference Level</u>	<u>Speed No-Load Reference Level</u>	<u>Start-Up Reference Level</u>	<u>Operating Reserve Offer Reference Level</u>
None	None	None	• <i>Dispatchable load</i>

3.4.1.6 Reference Levels for Non-Financial Dispatch Data Parameters

(MR Ch.7 ss.22.1.1 and 22.3.1)

Resources have two sets of *reference levels* for *non-financial dispatch data* registered, one each for season:

- the summer period, which is from May 1 to October 31; and
- the winter period, which is from November 1 to April 30.

Certain *reference levels* for *non-financial dispatch data parameters* are also registered for each *thermal state* (hot, warm, and cold) of a *resources*.

Table 3-12 sets out the *resource* types that have *reference levels* registered for each *non-financial dispatch data parameter*. For more information on the process the *IESO* uses to determine *reference levels* for *non-financial dispatch data parameters*, refer to MM 14.2: Reference Level and Reference Quantity Procedures.

Table 3-12: Reference Levels for Non-Financial Dispatch Data Parameters

<u>Non-Financial Reference Level</u>	<u>Registered for the Following Resource Types</u>
<u>Operating Reserve Ramp Rate Reference Level</u> ²⁶	<ul style="list-style-type: none"> • <u>Dispatchable load</u>

3.4.1.7 Reference Quantities

(MR Ch.7 ss.22.6.1)

Table 3-13 lists the *resource* types that have *reference quantities* registered in the *energy* and/or *operating reserve markets*. The *IESO* registers sets of *reference quantities* for each market in which a *resource* participates. For more information on the process the *IESO* uses to determine *reference quantities* and calculate *reference quantity values*, refer to MM 14.2: Reference Level and Reference Quantity Procedures.

Table 3-13: Reference Quantities by Technology Type and Market

<u>Energy Market</u>	<u>Operating Reserve Market</u>
<u>None</u>	<ul style="list-style-type: none"> • <u>Dispatchable load</u>

²⁶ A single *operating reserve ramp rate reference level* is registered that will be used to validate all applicable classes of *operating reserve ramp rates dispatch data* submission.

3.5. Registration of Facilities, Equipment, and Resources for Electricity Storage Participants

(MR Ch.7 ss.21.2)

All *electricity storage participants* must submit *facility* data and provide operational monitoring to the *IESO*. This includes:

- *electricity storage participants* intending to participate in the *IESO-administered* markets; and
- *embedded electricity storage participants* that are not market participants but are program participants.

Electricity storage participants intending to participate in the *IESO-administered* markets are required to register in accordance with this *market manual*.

In accordance with **MR Ch.7 ss.21**, the evolution of the participation framework for electricity storage in Ontario to potentially provide for fuller integration of electricity storage into the Ontario wholesale electricity markets and grid is under consideration by the *IESO*.

Some or all of the requirements set out herein may change as a result of such evolution, and the *IESO* may, in connection with such changes, require *electricity storage participants* to modify their registration and operational arrangements in accordance with future *market rule* amendments which may supplant the requirements stated herein.

An *electricity storage participant* can register its *facility* in one of three ways:

- *dispatchable electricity storage facility*;
- *self-scheduling electricity storage facility* providing *regulation*²⁷ service only
- *self-scheduling electricity storage facility* not providing *regulation* service

An *electricity storage participant* participating in the *energy market*, *operating reserve market*, or *capacity auction* must register its *facility* as a *dispatchable electricity storage facility*. For more details on *electricity storage facility* participation in the *capacity auction*, refer to [MM 12.0: Capacity Auctions](#).

An *electricity storage participant* participating in the *energy market* only (not the *operating reserve market* or *capacity auction*) may register as a *self-scheduling energy storage facility*, if its *electricity storage facility* size is less than 10 MW.

A *self-scheduling electricity storage facility* registered to provide *regulation* service will not be permitted to participate in the *energy market* or the *operating reserve market*.

²⁷ *Regulation* is an *ancillary service* that is currently contracted by the *IESO*. A contracted *electricity storage facility* may not exceed an *electricity storage facility* size of 50 MW as per **MR Ch.7 ss.21.3.2**.

Prior to registering with the IESO, electricity storage participants may be required to complete a connection assessment as described in MM 1.4: Connection Assessment and Approval.

3.5.1.1 Registering Resources

(MR Ch.7 ss.21.2)

Registration solution for electricity storage resources – Until such time that storage *resources* are more fully integrated into the IESO's tools, *electricity storage resources* are represented within the IESO tools as a combination of separate *generation* and *load resources* representing their injection and withdrawal capabilities respectively. *Electricity storage participants* registering their *resources* pursuant to **MR Ch.7 ss. 21.2**, must satisfy the registration requirements applicable to *generation* and *load resources*, as outlined in Table 3-14.

Table 3-14: Electricity Storage Resource Type versus Registration Requirements

Resource Type	Function	Applicable Registration Requirements
<i>Dispatchable electricity storage resource</i>	• <i>Injecting energy</i>	• <i>Dispatchable generation resource(s)</i>
	• <i>Withdrawing energy</i>	• <i>Dispatchable load resource(s)</i>
<i>Self-scheduling electricity storage resource (providing regulation)</i>	<i>Injecting energy</i>	<i>Self-scheduling generation resource(s)</i>
	<i>Withdrawing energy</i>	<i>No registration required</i>
<i>Self-Scheduling Electricity Storage resource (not-providing regulation)</i>	• <i>Injecting energy</i>	• <i>Self-scheduling generation resource(s)</i>
	• <i>Withdrawing energy</i>	• <i>Price responsive load resource(s)</i>
<i>Embedded Electricity Storage resource (only program participants²⁸)</i>	• <i>Injecting energy</i>	• <i>Self-scheduling generation resource(s)</i>
	• <i>Withdrawing energy</i>	• <i>Either Non-dispatchable load(s) or Price responsive load resource(s), only if required by the IESO</i>

Interim participation of electricity storage resources – The *market rules impose explicit requirements applicable to various types of electricity storage resources*. Considering that the *IESO's systems do not explicitly include storage resources, to satisfy these requirements, electricity storage participants participate in the IESO markets by adhering to the processes applicable to the other resource types as described in Table 3-14.*

²⁸ Embedded electricity storage resources that are associated with market participants will register in the other three categories stated above.

3.5.1.2 Facility Data

Electricity storage participants submit *facility* data via Online IESO for their equipment and *resources*.

In addition to the equipment data that is required in Online IESO, the *IESO* requires additional data listed in Table 3-15.

Table 3-15: Additional Data Required for Electricity Storage Facilities

Parameter	Description
<u>Certified Duration of Service (injecting)</u>	<u>The certified time an <i>electricity storage facility</i> can inject continuously until it reaches its Certified Lower Energy Limit, assuming the <i>electricity storage facility</i> operates at its Upper Power Operating Limit (injecting).</u>
<u>Certified Duration of Service (withdrawal)</u>	<u>The certified time an <i>electricity storage facility</i> can withdraw continuously until it reaches its Certified Upper Energy Limit, assuming the <i>electricity storage facility</i> operates at its Upper Power Operating Limit (withdrawing).</u>
<u>Cycle Efficiency</u>	<u>The percentage of withdrawn <i>energy</i> that is re-injected over one full cycle of the <i>electricity storage facility</i>. During any certification or recertification test, <i>energy</i> withdrawals occur at the Lower Power Operating Limit (withdrawing) and <i>energy</i> injections occur at the Upper Power Operating limit (injecting).</u>
<u>Certified Upper Energy Limit</u>	<u>The highest certified <i>energy</i> amount to which an <i>electricity storage unit</i> can be consistently charged without damage beyond expected degradation from normal use.</u>
<u>Certified Lower Energy Limit</u>	<u>The lowest certified <i>energy</i> amount to which an <i>electricity storage unit</i> can be consistently discharged without damage beyond expected degradation from normal use.</u>
<u>Upper Power Operating Limit (injecting)</u>	<u>The maximum active power output (MW) for operation when injecting.</u>
<u>Lower Power Operating Limit (injecting)</u>	<u>The minimum active power output (MW) for operation when injecting.</u>
<u>Upper Power Operating Limit (withdrawing)</u>	<u>The maximum active power consumed (MW) when withdrawing.</u>
<u>Lower Power Operating Limit (withdrawing)</u>	<u>The minimum active power consumed (MW) when withdrawing.</u>

3.5.1.3 Data Monitoring

(MR Ch.4 ss.7.3A and App.4.24)

As market participants, electricity storage participants are subject to the operational data monitoring requirements on a facility basis as outlined in MR Ch.4 App.4.24.

Electricity storage participants that provide regulation will need to provide a basepoint, which is an economic dispatch value (in MW) as determined by the IESO or the market participant.

Within the required monitoring data outlined in MR Ch.4 App.4.24, there are several additional monitoring data unique to electricity storage that electricity storage participants are required to provide to support the evolution of the permanent framework. These requirements are summarized in Table 3-16.

Table 3-16: Electricity Storage Data Monitoring – Evolving Framework for Electricity Storage

Telemetry Point	Description
<u>Economic Maximum Power Mode (ECO $P_{max,g}$)</u>	<u>The dynamic, current maximum active power output for operation as provided by the market participant.</u>
<u>Economic Minimum Power Mode (ECO $P_{min,g}$)</u>	<u>The dynamic, current minimum active power output for operation as provided by the market participant.</u>
<u>Economic Minimum Charge Limit (ECO $SOC_{min,g}$)</u>	<u>The dynamic, current minimum energy limit (MWh) that is provided by the market participant.</u>
<u>Economic Maximum Charge Limit (ECO $SOC_{max,g}$)</u>	<u>The dynamic, current maximum energy limit (MWh) that is provided by the market participant.</u>

All operational monitoring shall be communicated to the IESO in accordance with IESO approved methodologies and standards as set out in MM 6 ss.4.

3.5.1.4 Requirements for Operating Reserve Market Participation

(MR Ch.7 ss.2.2.8 and 21.7)

Electricity storage participants may elect to register to provide operating reserve in one of the following ways:

- with its injection capability only (i.e., as a generation resource);
- with its withdrawal capability only (i.e., as a load resource); or
- with both its injection and withdrawal capabilities (i.e., as both a generation resource and a load resource).

Electricity storage participants wishing to provide operating reserve must meet the eligibility criteria for participation in either the ten-minute operating reserve or thirty-minute operating reserve markets, or both markets, as described in Table 3-17. Operating reserve offers and operational requirements for electricity storage facilities are described in MM 4.2: Submission of Dispatch Data in the Real-Time Energy and Operating Reserve Markets.

Table 3-17: Requirements for Operating Reserve Market Participation

	<u>Requirement</u>	<u>Purpose and/or Applicable Rule, Standard, etc.</u>
1	<p><u>To offer operating reserve from the load resource:</u></p> <p>Electricity storage must be able to withdraw continuously for at least 70 minutes at or above the minimum operating reserve capability (withdrawal). The minimum operating reserve capability (withdrawal) must be at least 1 MW.</p>	<p>This is to ensure that the facility has the capability to withdraw continuously at the minimum operating reserve capability for an adequate duration before reducing to zero consumption should an activation be called at the end of a dispatch hour. For more details, refer to MM 4.2 App. A.</p>
2	<p><u>To offer operating reserve from the generation resource:</u></p> <p>Electricity storage must be able to inject continuously for at least 130 minutes at or above the minimum operating reserve capability (injection). The minimum operating reserve capability (injection) must be at least 1 MW.</p>	<p>This is to ensure that the facility has the capability to inject continuously at the minimum operating reserve capability for an adequate duration should an activation be called at the end of a dispatch hour. For more details, refer to MM 4.2 App. A.</p>
3	<p><u>To provide operating reserve from the load resource:</u></p> <p>Electricity storage must be able to maintain a zero consumption level for at least one hour when activated for ten-minute operating reserve or thirty-minute operating reserve.</p>	<p>Comply with NPCC Directory 5 Reserve</p>
4	<p><u>To provide operating reserve from the generation resource:</u></p> <p>Electricity storage must be able to sustain level of operating reserve provided for at least one hour when activated for ten-minute operating reserve or thirty-minute operating reserve</p>	<p>Comply with NPCC Directory 5 Reserve</p>

Requirement		Purpose and/or Applicable Rule, Standard, etc.
5	Electricity storage must be able to respond to the IESO's activation request for <i>ten-minute operating reserve</i> and provide <i>offering reserve</i> within 10 minutes	<ul style="list-style-type: none"> • MR Ch.11 definitions of <i>ten-minute operating reserve</i> and <i>thirty-minute operating reserve</i> • <u>NERC Glossary of Terms</u>
6	Electricity storage must be able to respond to the IESO's activation request for <i>thirty-minute operating reserve</i> and provide <i>offering reserve</i> within 30 minutes	<ul style="list-style-type: none"> • MR Ch.11 definitions of <i>ten-minute operating reserve</i> and <i>thirty-minute operating reserve</i> • <u>NERC Glossary of Terms</u>

3.5.3.6. Aggregation of Equipment and Resources

(~~Market Rules: Chapter MR Ch.7, sections ss.2.3~~)

At or subsequent to their initial registration, *market participants* may apply to aggregate *generation units*, *electricity storage 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.

3.5.1.3.6.1. 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, ~~consider~~ two generators, G1 and G2, each ~~have~~having a *dispatch* of 5 MW. Under compliance aggregation, G1 may generate 3 MW and G2 ~~may generate~~ 7 MW, meeting the total *dispatch* of 10 MW. This is ~~typically~~typical for ~~river systems whose generation facilities that are part of river systems that~~ do not share common *connection points* (~~hence ineligible for aggregation~~), but may individually ~~suffer~~experience 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 [MM 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*.

3.6.3.7. Participation in Centralized Forecasting Service for Generation Facilities that have Variable Generation Facility Registration Resources

~~(Market Rules: Chapter (MR Ch.4, section ss.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 that has *variable generation resources* is required to:~~

- ~~authorize~~ authorized 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.

3.6.1.3.7.1. Operational and Meteorological Monitoring

~~(MR Ch.4 App.4.15 and 4.19)~~

As a *market participant*, a *generation facility that has variable generator generation resources*²⁹ must provide operational telemetry to the *IESO* and is subject to the operational monitoring requirements outlined in ~~market rules Appendix MR Ch.4 App.4.15~~ and to the performance requirements outlined in ~~market rules Appendix MR~~

²⁹ As per ~~Market Rules Appendix MM Ch.4 App.4.19~~, the *IESO* considers medium performance to be acceptable for embedded *variable generators* (i.e., program participants).

Ch.4 App.4.19. These requirements are based on a per *facility* basis. All operational monitoring ~~shall~~**must** be provided to the *IESO* ~~as~~ per the specifications ~~defined~~**set out** in ~~section~~**MM 6 ss.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).

~~3.6.2.3.7.2.~~ 3.6.2.3.7.2. 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.³⁰ However, the minimum number of meteorological towers or sodar/lidar units per *facility* must be met, as per Table 3-18, 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.

~~3.6.3.3.7.3.~~ 3.6.3.3.7.3. Meteorological Towers and Sodar/Lidar Technology

Wind *facilities* ~~shall~~**must** 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~~**Table C-4** of Appendix C.

Table 3-18: 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

³⁰ As alternative technologies are identified, the *IESO* will review their compatibility with the existing requirements and where appropriate expand the list of acceptable technologies.

Facility Size	Total Number of Meteorological Towers or Sodar/Lidar Units per Facility
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

3.6.4.3.7.4. 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.

3.7.3.8. 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](#).

3.7.1.3.8.1. Commission Equipment

~~(Market Rules: Chapter MR Ch. 7, sections ss. 2.2A and 2.2D)~~

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 [MM 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.

~~3.7.2.3.8.2.~~ 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. (MR Ch.2 ss.6)~~

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~~The Equipment Registration Specialist will receive a notification ~~from~~through Online IESO ~~during the Register Equipment procedure~~ if performance validation is required. For more information, refer to [Market Manual 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~~*market participant, program 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 MR Ch.1, section ss.11.3.1; Chapter and MR Ch.2, section ss.3.1.8)~~

~~Each Participant~~*Each market participant, program 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~~*market participant, program participant*, and service provider authorization type;
- bank account data;
- supporting documentation (e.g., *prudential* support, OEB licence, CER permit); and
- applicable market control entities or market control ~~entity~~*entities* 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~~ An Authorized Representative of a Participant ~~market participant, program participant,~~ or service provider ~~wishes to change their~~ may initiate an organization name, ~~as stated in the original participation agreement,~~ then the Authorized Representative ~~must initiate a change by sending a change request to~~ by emailing market.registration@ieso.ca ~~as soon as possible after the name change date has been officially set.~~ The request ~~should~~ must include the reason for the name change.

The ~~Participant~~ *market participant, program participant,* or service provider will then 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~~ The IESO will advise the Authorized Representative whether any additional supporting documents are needed. If no additional supporting documents are needed, the ~~Participant~~ *market participant, program participant,* or service provider will must 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 changing their organization name must also 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~~ that have access to the IESO systems used for exchanging data between themselves and the IESO (e.g., Online IESO, IESO ~~Portal~~ gateway). For these situations, refer to [MM 1.3: Identity Management Operations Guide](#) for information on system access.

4.1.4. Changes to Mandatory Organization Contacts

~~Participants or~~ *Market participants, program participants and* 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 by 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~~*market participant's, program participant's* 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~~*must* 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

(MR Ch.1 ss.11.3.1)

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.);
 - *bid/offer* type data parameter for *generation resources* (*dispatchable* [regular]³¹, *non-dispatchable*, *self-scheduling*, *intermittent*);
 - *bid/offer* type data parameter for *load resources* (*dispatchable* [regular]³², *day-ahead price responsive*³³, *non-dispatchable*);
 - *operating reserve* class (~~10~~*ten*-minute or ~~30~~*thirty*-minute);
 - *facility* type (*generation facility*, *load facility*, etc.);
 - *combined cycle facilityplant* 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*;
- ~~Market participants~~ and
- ~~changes to market control entities or market control entity for physical withholding, as applicable.~~

Participants program 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

³¹ 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*.

³² Sandbox testing, facilitated by the *IESO*, is required for new *registered market participants* becoming *dispatchable* for the first time.

³³ Sandbox testing, facilitated by the *IESO*, is required for new *registered market participants* becoming *price responsive* for the first time.

may impact the data stored in Online IESO or the supporting documentation relating to the *facility*.

Any changes that a ~~Participant~~market participant, program participant, or service provider 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~~market participant, program participant, or service provider 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~~market participants or program participants with existing *facilities*, the *IESO* will issue a RAN for changes including, but not limited to:

- *resource* data parameter changes:
 - *operating reserve* class;
 - decrease/increase in maximum capacities;
 - *bid/offer* type,
 - ~~MRT~~minimum run-time, MGBRT, ~~MLP~~minimum loading point;
 - *reference levels, reference quantities*; and
 - participation in an *IESO* program (e.g., ~~generator~~generator, *generation offer guarantee* status);
- equipment data changes (including operating nomenclature changes):
 - breaker, transformer, and switch replacements;
 - static VAR ~~Compensator~~compensator (SVC), STATCOM, capacitor and reactor;
 - ~~Remedial Action Scheme~~remedial action scheme; and
 - modifications to ~~Automatic Voltage Regulator~~automatic voltage regulator (AVR), ~~Power System Stabilizer~~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~~is 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~~market participant or program participant 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~~*market participant's or program 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~~*market participant or program participant* to redo certain *facility* tests (refer to [section 3.2.5](#)). After assessment of the requested changes, the IESO will notify the ~~Participant~~*market participant or program 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 MR Ch.7, sections ss.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~~[180 calendar days](#) 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 ~~responseresponsive~~ responsive load* must do so at least ~~one~~ 75 calendar days 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 calendar months.

A market participant for a load resource at a dispatchable electricity storage facility will not be eligible to change the resource's bid/offer type from Dispatchable to Day-ahead price responsive or Non-dispatchable if the associated storage generation resource has a bid/offer type of Dispatchable.

A market participant for a price responsive load storage resource will not be eligible to change the resource's bid/offer type from Day-ahead price responsive to Dispatchable or Non-dispatchable if the associated storage generation resource is a self-scheduling storage resource.

4.2.3. Assessments for Operating Reserve Market Participation

~~Requests~~The *IESO* will assess 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 to determine whether:~~

- ~~whether~~ the resource is eligible to provide ~~10-minute~~ spinning *ten-minute operating reserve*. *Boundary entities* ~~entity resources~~ are not eligible to offer spinning ~~10~~ *ten-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* ~~resource~~ is eligible to provide *ten-minute operating reserve* or *thirty-minute operating reserve*.

4.2.4. Changes to Self-Scheduling Generators

~~(Market Rules: Chapter MR Ch. 7, sections ss. 2.2.9 and 2.2.11)~~

~~Requests~~The *IESO* will assess 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 MR Ch. 7, section ss. 2.2.15)~~

~~Requests~~The *IESO* will assess requests for changes to *intermittent generation* ~~will be assessed ensuring to ensure~~ that the change to the *facility* will not affect *security* of the *IESO-controlled grid*. ~~Participants~~ *Market participants and program 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 MR Ch. 7, section ss. 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 \(OEFQ\)](#).

4.2.7. Transfer of Facility Registration

(~~Market Rules: Chapter MR Ch. 7, section ss. 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 **the** 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 MR Ch.1, section ss.11.1 and Chapter MR Ch.2, section ss.3.1.8~~)

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

- OEB licence;
- connection agreement;
- ~~Restoration Participant Attachment;~~
- 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 MR Ch.7, section ss.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 *facility* will not potentially:
 - endanger the safety of any person;
 - damage equipment; or
 - 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 MR Ch.7, section ss.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*³⁴ of receiving a *market participant's* request to deregister a *facility*, the *IESO* will inform the *market participant* and the *transmitter* to whose

³⁴ The deregistration of a generator, for example, may require a ~~sufficiently~~ longer time period to determine whether a technical assessment is required.

transmission system the *facility* is *connected* (if applicable) as to whether or not an *IESO* technical assessment of the impact of the *facility's* disconnection on the *reliability* 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 participant* 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 participant* 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/ <u>Market</u> Participant Actions
<ul style="list-style-type: none"> • impacts, or could potentially impact the <i>reliability</i> of the <i>IESO-controlled grid</i>; or • could potentially endanger the safety of any person, damage equipment, or violate any <i>applicable law</i> (e.g., environmental); 	<ul style="list-style-type: none"> • The <i>IESO</i> will not grant approval for the deregistration of the <i>facility</i>. • The <i>IESO</i> Contract Management staff and the relevant <i>market participant</i> are required by the <i>market rules</i> to enter into good faith negotiations to conclude an agreement for a <i>reliability must-run contract</i> for the applicable <i>facility</i>.³⁵

³⁵ 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/ <u>Market</u> Participant Actions
<ul style="list-style-type: none"> • does not impact the <i>reliability</i> of the <i>IESO-controlled grid</i>; • does not endanger the safety of any person, damage equipment, nor violate any <i>applicable law</i> (e.g., environmental); • If <u>if</u> the <i>facility</i> is not directly connected to the <i>IESO-controlled grid</i> 	<ul style="list-style-type: none"> • Upon receiving the <i>IESO response</i> to the deregistration request, the Participant<u>market participant or program participant</u> shall email <i>IESO</i> to advise of the date they want the <i>facility</i> deregistered. • The deregistration date shall not be less than five (5) <i>business days</i> from the date the Participant<u>market participant or program participant</u> receives the notification from the <i>IESO</i> that the deregistration request is approved. <p>The <i>IESO</i> will issue a disconnection letter to the <i>distributor</i> or host customer, noting that the <i>facility</i> will be deregistered and the date of the deregistration. The distributor or host customer will notify the <i>IESO</i> when the <i>facility</i> is <i>disconnected</i>.</p>
<ul style="list-style-type: none"> • does not impact the reliability of the <i>IESO-controlled grid</i>; • does not endanger the safety of any person, damage equipment, nor violate any <i>applicable law</i> (e.g., environmental); and • If <u>if</u> the <i>facility</i> is directly <i>connected</i> to the <i>IESO-controlled grid</i> 	<ul style="list-style-type: none"> • Upon receiving the <i>IESO response</i> to the deregistration request, the <i>market participant</i> shall email <i>IESO</i> to advise of the date they want the <i>facility</i> deregistered. • The deregistration date shall not be less than five (5) <i>business days</i> from the date the Participant<u>market participant or program participant</u> receives the notification from the <i>IESO</i> that the deregistration request is approved. <p>The <i>IESO</i> will then:</p> <ol style="list-style-type: none"> 1. Issue<u>issue</u> a disconnection letter to the relevant <i>transmitter</i>, directing it to disconnect the <i>facility</i> from the <i>IESO-controlled grid</i> on the date specified in the notice filed by the <i>market participant</i>; and 2. Deregister<u>deregister</u> the <i>facility</i> on the date they receive confirmation from the relevant <i>transmitter</i> that the <i>facility</i> has been <i>disconnected</i>.

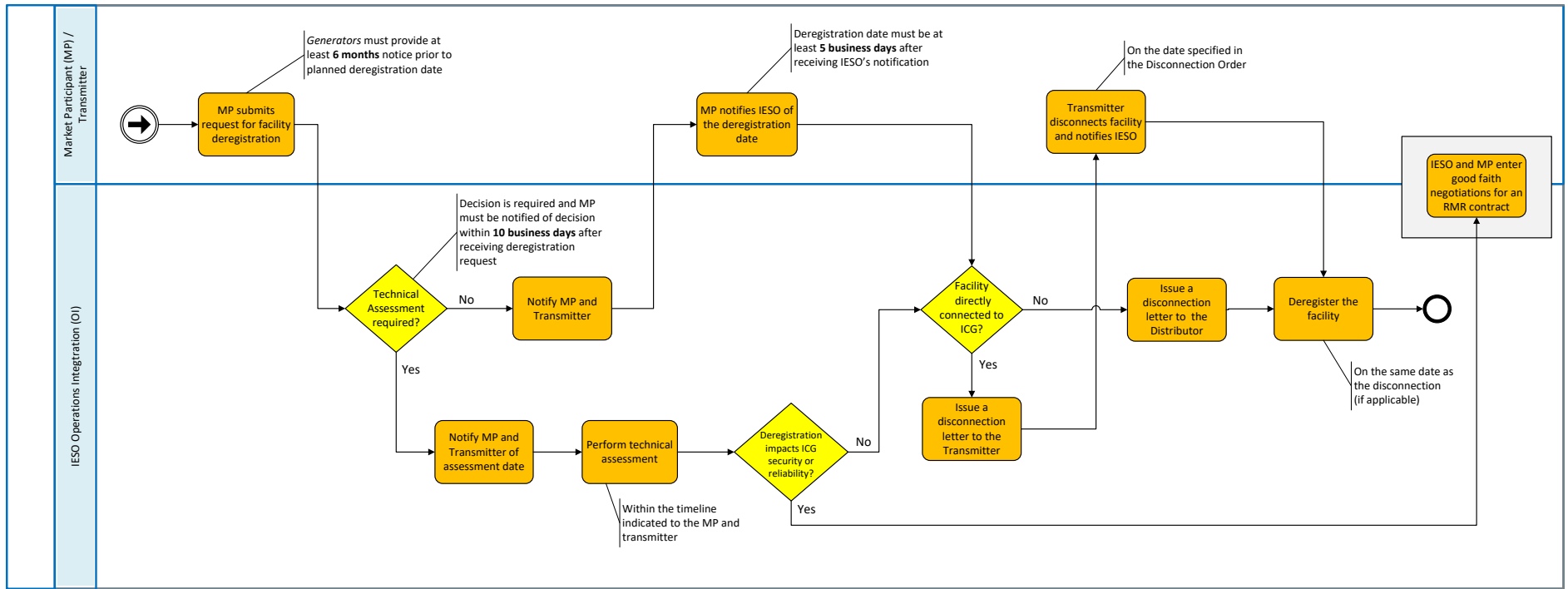


Figure 5-1: Facility Deregistration Process (requested by Market Participant)

5.2. Market Participant, Program Participant or Service Provider Withdrawal

(~~Market Rules: Chapter MR Ch.2, section ss.9~~)

The following types of ~~Participants~~*market participants, program 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~~*market participant, program participant,* or service ~~providers~~*provider is* 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~~The *market participant, program 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'~~A *market participant's, program participant's* or service ~~providers'~~*provider's* 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, program participant, or service provider* shall enter into good faith negotiations to conclude an agreement for a *reliability must-*

run contract for the applicable *facility*.³⁶ The *facility* shall not be removed from service during the course of such a process.

If the *IESO* determines that a ~~Participant~~*market participant's, program participant's,* or service provider's withdrawal can proceed as per the Application for Withdrawal, the *IESO* will send ~~the Participant~~*them* a RAN confirming that the company is authorized to withdraw, and will update the *market participant's, program participant's, or service provider's* registration record to indicate that they have withdrawn their participation in the *IESO-administered markets* or programs, as 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 *resources* 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*; and
- 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 MR Ch.3, section ss.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*.

³⁶ The process is described in ~~Chapter MR Ch.7, Section ss.9.6 and 9.7~~ and in ~~Chapter MR Ch.5, Section ss.4.8 of the market rules~~ as explained in ~~Chapter MR Ch.7, Section ss.2.4.5~~.

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

5.3.2. Deregistration for Non-Compliance

(~~Market Rules: Chapter MR Ch. 3, section ss 6.2, 6.2A and 6.5~~)

The *IESO* may seek to deregister a *facility* and/or 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~~ [in respect of](#) 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 [MM 2.6: Treatment of Compliance Issues](#).

- ~~•~~
- ~~• Chapter 3, sections 6.2 and 6.2A of the market rules~~

– End of Section –



Appendix A: ~~Appendix A:~~ Organization Contact Roles

Table A-1~~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~~A-1~~: Organization Contact Roles

Role	Description
Bids and Offers	Person or section to be contacted regarding the <i>bids</i> or <i>offers</i> 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 <i>IESO</i> 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 <i>IESO-administered markets</i> 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 <i>bids</i> or <i>offers</i> for the organization.
Dispatch Data Submitter	Person responsible for submitting and/or changing the real-time <i>bids</i> , <i>offers</i> or schedules for the organization.
Dispatch Data Viewer	Person responsible for viewing submitted real-time <i>bids</i> , <i>offers</i> or schedules for the organization.
Dispatch Instruction Operator(s)	Person(s) responsible for receiving, accepting, or rejecting <i>dispatch instructions</i> . Each <i>market participant</i> who may receive <i>dispatch instructions</i> must have at least one Dispatch Instruction Operator registered with the <i>IESO</i> .

Role	Description
e-Tag Curtailment	Person or section responsible for receiving notifications regarding the limiting of <i>energy</i> flow on an arranged and/or confirmed interchange transaction for the organization.
Emergency Preparedness Plan	Person responsible for submitting and updating the <i>emergency preparedness plan</i> for the organization.
Equipment Outage Submitter	Person responsible for submitting, updating, canceling and viewing <i>outage</i> requests on equipment owned or operated by the organization.
Equipment Outage Viewer	<p>Person who can view <i>outage</i> information on equipment owned or operated by the organization, and equipment permitted for viewing by other organizations.</p> <p>Note: Do not select this role if the Equipment Outage Submitter is already selected for this individual.</p>
Equipment Registration Specialist	<p>Person responsible for submitting attributes to their equipment, <i>facility</i>, and <i>resources</i> for the organization.</p> <p>For more information, refer to section 3.1.2.</p>
Information Technology	Person or section responsible for communicating with the <i>IESO</i> 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 <i>outages</i> .
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.

Role	Description
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.
Market Power Mitigation Contact	Person responsible for registering <i>reference levels</i> and <i>reference quantities</i> for a <i>resource</i> of their organization, and <i>for</i> corresponding with the <i>IESO</i> regarding <i>physical withholding</i> and <i>economic withholding</i> assessments.
Notice of Disagreement	Person responsible for submitting Notices of Disagreement for <i>settlement</i> statements for the organization.
Prudential Requirements	Person responsible for submitting <i>prudential</i> information and is the point of contact for any issues regarding <i>prudential</i> security (e.g., margin calls, warnings and defaults) for the organization.
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 <i>settlement statements</i> for the organization.

– End of **SectionAppendix** –

Appendix B: ~~Appendix B:~~ Technical Communication 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(MR Ch.2, App.2, Ch.4, Ch.5 and Ch.7)~~

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-1B-1: Market Rule Technical Requirements

	<u>Chapter 2 & Appendices</u>				<u>Chapter 4 & Appendices</u>	<u>Chapter 7</u>	
	General	Voice	Data Monitoring	Workstations	Data Monitoring Requirements & Performance Standards	Communications Reliability	
						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 G+

Appendix C: Wind Facility Resource Data Requirements

Table C-1 ~~Table C-1~~ identifies *facility resource* data requirements for the physical layout and details of the turbines. *Market participants that have wind resources* must also refer to [section 3](#) for registration requirements.

Table C-1: Wind Facility Resource 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 ~~Table C-2~~ identifies operational monitoring requirements for wind *generation facilities/resources*.

Table C-2 ~~C-2~~: Wind ~~Facility~~Resource Operational Monitoring Requirements

Operational Monitoring Requirements			
Measurement Type	Unit of Measure	Height of Measurement	Precision (to the nearest...)
MW output ³⁷ (per <i>facility</i>)	Megawatt (MW)	N/A	0.1 MW
Available Megawatts ³⁸	Megawatt (MW)	N/A	0.1 MW

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

Table C-3 ~~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

³⁷ Megawatts shall be provided as one measurement per *connection point*.

³⁸ 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).

Meteorological Tower and Sodar/Lidar Unit Requirements				
#	Measurement Type	Unit of Measure	Height of Measurement	Precision (to the nearest...)
5	Relative Humidity	Percentage (%)	Can be provided from any height	1 %

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 ³⁹	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 Appendix** –

³⁹ 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: ~~Appendix D: Solar Facility~~Resource Data Requirements

Table D-1~~Table D-1~~ identifies *facilityresource* data requirements for the physical layout and details of the solar arrays. *Market participants that have solar resources* must also refer to [section 3](#) for registration requirements.

Table D-1~~D-1~~: Solar ~~Facility~~Resource Data Requirements

#	Static Plant Data	Description
1	Solar <i>facility</i> location (latitude and longitude) ⁴⁰	Physical location (GPS coordinates) of each solar array ⁴¹ .
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	<i>Generation capacity</i> of the generating <i>facility</i> and each <i>generation unit</i>	The name plate capacity of the entire <i>facility</i> 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) ⁴² , etc.
8	Module Type	Crystalline, Thin-Film, Concentrated PV (CPV) etc.

⁴⁰ 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.

⁴¹ Solar array is defined as a collection of solar panels that share a *connection point* going into an inverter.

⁴² If the tracking feature is disabled the *generator* shall notify the *IESO* using the address renewableforecastinfo@ieso.ca with as much notice as possible.

#	Static Plant Data	Description
9	Wind Protection	Wind speed at which panels are stored to avoid damage. (If applicable)

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

Table D-2~~D-2~~: Solar FacilityResource Operational Monitoring Requirements

Operational Monitoring Requirements					
#	Measurement Type	Definition	Unit of Measure	Data Required for	Measurement Precision
1	MW output ⁴³ (per <i>facility</i>)	Current Megawatt (MW) output for the <i>facility</i>	Megawatt (MW)	All	0.1 MW
2	Available Megawatts ⁴⁴	What the <i>facility</i> can produce after deducting <i>outages</i>	Megawatt (MW)	All	0.1 MW

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

Table D-3~~D-3~~: Solar FacilityResource 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

⁴³ Megawatts shall be provided as one measurement per *connection point*.

⁴⁴ 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
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
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 ⁴⁵	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 – Appendix –

⁴⁵ 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 <u>Generation</u> offer guarantee
MGBRT	<i>Minimum generation block run-time</i>
MLP	<i>Minimum loading point</i>
NAESB	North American Energy Standards Board
<i>OEB</i>	<i>Ontario Energy Board</i>
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
	Market Manual 14.2: Reference Levels and Reference Quantities
IMO_GDE_0001	Market Participant Emergency Plan Guidelines & Requirements
LST-48	Register Equipment Help File

Document ID & Link	Document Title
	Prudential Training Guide

– End of Document –