



Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R00		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	Revenue Metering Standards		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	6	Appendix:	
Sections:	4.6 (new), 4.1		
Sub-sections proposed for amending:	4.1.1; 4.6.1 – 4.6.7 (new)		

PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Submitted for Technical Panel Review	January 19, 2005
2.0	Incorporate Technical Panel Comments; Publish for Stakeholder Review and Comment	January 28, 2005
3.0	Submit for Technical Panel Review and Vote	February 23, 2005
4.0	Recommended by Technical Panel, Submitted for IESO Board Approval	March 1, 2005
5.0	Approved by IESO Board	June 2, 2005
Approved Amendment Publication Date:	June 6, 2005	
Approved Amendment Effective Date:	September 14, 2005	

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

This market rule amendment proposal is in response to requests from distributed generation and distributed demand management project proponents for the IESO to review its revenue metering requirements for small facilities.

Specifically it is proposed to simplify the revenue metering requirements for small embedded generation facilities in the market rules including the following: meter type, provision of an Emergency Instrument Transformer (IT) Restoration Plan, on-site reconciliation and meter register dial readings, and instrument transformer loading. IESO staff believes that the market rules can be so amended and thereby reduce the barriers for small embedded generation and load facilities with no material impact on the reliability of the IESO-controlled grid or on the efficient operation of the IESO-administered markets. This assessment is based on the (small) size of these facilities, the fact that they are embedded rather than connected to the IESO-controlled grid, and that the amount of dollars that would be transacted annually through their revenue meters is relatively small. The IESO would, however, need to retain the right to request additional information as indicated in the Chapter 4 appendices from such a facility if the lack of such information were determined to potentially have an adverse impact on the reliable operation of the IESO-controlled grid or on the efficient operation of the IESO-administered markets. The proposed lowering of the revenue metering requirements will reduce the development costs of these projects and potentially increase the number of distributed generation and distributed demand management facilities that participate in IESO-administered markets in future.

It is also proposed that all references in Chapter 6 to the IMO be changed to the IESO, in order to align the market rules with the name change under Bill 100.

Background

Proponents of distributed generation and distributed demand management projects have requested the IESO to review its technical requirements and revenue metering requirements for small facilities. These proponents have identified the existing requirements as significant barriers to participating in the IESO-administered markets. In addition, project proponents responding to the Government of Ontario's Request for Proposal (RFP) for new, renewable electricity capacity have expressed similar concerns. This RFP specifies that the minimum size for eligible projects would be 500 kW and that the proponent must become a market participant in the IESO-administered markets and comply with the market rules. For further information on this and other Government electricity demand/supply initiatives please refer to <http://www.ontarioelectricityrfp.ca>. It is expected that successful projects under this RFP will be small embedded load and generation facilities.

Small embedded generation facilities (500 kW to 5 MW) which typically have a low capacity factor (<500 hours per year) and hence generate limited annual revenues in the IESO-administered markets cannot justify the cost of meeting the wholesale revenue metering requirements specified in Chapter 6, section 4.1. The requirements are specified in Market Manual – Wholesale Revenue Metering Standard

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– Hardware (MDP_STD_0004). The IESO has worked with the Revenue Metering Sub-committee of the Market Operations Standing Committee (MOSC) to determine to what extent establishing a different revenue metering requirement for small embedded generation facilities is appropriate. Extending this different revenue metering requirement to small embedded loads is not recommended for the following reasons. Firstly, a generator has a strong financial driver to ensure that its revenue metering is accurate so that it gets paid for its actual output. A load customer may not have such a strong financial driver. Secondly, the host distributor is billed by the IESO-administered market for the difference between its wholesale revenue meter reading and the revenue meter readings of embedded market participants. In the event that the revenue meters for an embedded load in reading less than the actual consumption, the host distributor would be financially responsible to the IESO-administered market for that error. This distributor financial exposure is judged to be inappropriate.

Discussion

It is proposed to insert a new section 4.6 in Chapter 6 of the market rules that would establish the revenue metering requirements for small embedded generation facilities. This section would specify:

- The threshold for determining facility eligibility - a market participant with a generation facility which injects less than 17 GWh per annum into the IESO-controlled grid or has a nameplate rating of 2 MVA or less would be deemed eligible to register a metering installation with the IESO which comprises a standalone meter. This 17 GWh per annum figure may be achieved by a facility with a lower MVA rating and high capacity factor or a facility with a higher MVA rating and a lower capacity factor (section 4.6.1);
- The meter that may be used must be an alternate meter or main meter from the IESO's list of conforming meters. This will ensure that the standalone meter is comparable to other revenue meters in the market (section 4.6.2);
- There would be no obligation for the meter service provider to provide an Emergency Instrument Transformer restoration plan. A restoration plan entails maintaining spare instrument transformers which may be expensive for small facilities (section 4.6.3);
- Specifying that the IESO will estimate metering data in the manner specified in section 11.1.4A of Chapter 6 (i.e. to be zero) if there is an instrument transformer failure at the metering installation (section 4.6.4);
- The metered market participant would not be required to meet the testing requirements set out in section 1.2 of Appendix 6.3 (On-Site Reconciliation & Meter Register Dial Readings). Since the standalone meter would be a conforming meter these testing requirements are not required because they would only duplicate the information which can already be electronically retrieved from these meters by the IESO (section 4.6.5);
- The metered market participant would be permitted, subject to IESO approval, to place additional loads on its instrument transformer. The IESO recognizes that the economics of small generation facilities may lead to the use of instrument transformers for supervisory control and data acquisition systems (SCADA) and protection and control. Provided this additional loading would not impair the functioning of the instrument transformer the IESO would consider allowing it, on a case by case basis, for small generators (section 4.6.6).
- The obligation for the metered market participant to upgrade a meter installation within 3 months of notification by the IESO if the energy threshold is exceeded at the metering installation. This

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obligation will ensure the financial integrity of the IESO-administered markets (section 4.6.7).

The proposed insertion of a new section 4.6 necessitates a consequential reference in one other section of Chapter 6 of the market rules. Therefore, the following additional rule amendment is also proposed:

- Amend section 4.1.1 (Metering Installation Standards) of Chapter 6 by including a consequential reference to section 4.6.

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4. Metering Installation

4.1 Metering Installation Standards

4.1.1 Subject to sections 4.1.2, ~~and 4.4,~~ and 4.6, each *metering installation* shall:

- 4.1.1.1 contain *meters* that are of a type that are described on the list of conforming *meters* established by the *IMO*;
- 4.1.1.2 be comprised of two *meters*, at least one of which shall be a *revenue meter* that meets or exceeds the 0.2% accuracy class of ANSI standard C12.20;
- 4.1.1.3 have *instrument transformers* whose current transformers and voltage transformers meet or exceed the 0.3% accuracy class of ANSI standard C57.13;
- 4.1.1.4 meet the accuracy requirements set forth in this Chapter and in any policy or standard established by the *IMO* pursuant to this Chapter;
- 4.1.1.5 meet the security requirements set forth in this Chapter and in any policy or standard established by the *IMO* pursuant to this Chapter;
- 4.1.1.6 subject to section 10.3.2, be capable of collating *metering data* into *dispatch intervals*;
- 4.1.1.7 be capable of separately registering and recording flows in each direction where bi-directional active *energy* flows may occur;
- 4.1.1.8 be capable of allowing remote access to the *metering data* contained in the *metering installation* in the manner set forth in this Chapter and in

any policy or standard established by the *IMO* pursuant to this Chapter;

- 4.1.1.9 be capable of storing *metering data* for at least 35 days; and
- 4.1.1.10 comply with all other requirements set forth in this Chapter and in any policy or standard established by the *IMO* pursuant to this Chapter.

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- 4.1.7 Each *metered market participant* shall ensure that any *instrument transformer* forming part of a *metering installation* in respect of which it is the *metered market participant* is not used for a purpose other than the measurement of *energy* for *settlement* purposes unless:
 - 4.1.7.1 the instrument transformer is part of a main/alternate metering installation;
 - 4.1.7.2 the *instrument transformer* is not connected to the *revenue meter* that has been designated by the *metered market participant* as the main *revenue meter* as reflected in the registration information pertaining to the *main/alternate metering installation*; and
 - 4.1.7.3 the *instrument transformer* is operated within the rated burden limits for the accuracy class referred to in section 4.1.1.4.

or

- 4.1.7.4 the *metering installation* is registered under section 4.6 and the *IESO* has approved the placing of additional loads on the *instrument transformer* under section 4.6.6.

4.6 Metering Installation Standards for Embedded Generation Facilities Under 2 MVA or Injecting Less than 17 GWh Per Annum

- 4.6.1 A *market participant* that has a registered *minor generation facility* **embedded within a *distribution system*** and which **either** injects less than 17 gigaWatt-hours per annum or has a nameplate rating less than 2 MVA shall be eligible to register **with the *IESO* a *metering installation* for that *generation facility*** comprised of a *standalone meter*.
- 4.6.2 The *standalone meter* shall be either a **main meter** or an **alternate meter** from the *IESO's* conforming *meter list*.

- 4.6.3 The *meter service provider* for the *metering installation* registered **under** section 4.6.1 shall not be required to submit an emergency *instrument transformer* restoration plan **otherwise required under** section 1.3.2.17 of Appendix 6.5.
- 4.6.4 If there is a failure of an *instrument transformer* at a *metering installation* registered in accordance with **this** section, the **IESO shall estimate the metering data from the metering installation for settlement purposes in accordance with** section 11.1.4A of Chapter 6 for the duration of the failure.
- 4.6.5 The *metered market participant* for a *meter* registered in accordance with this section shall not be required to meet the testing requirements specified in section 1.2 of Appendix 6.3.
- 4.6.6 The *metered market participant* for a *metering installation* registered in accordance with this section shall, subject to **IESO** approval, be permitted to place additional loads on its *instrument transformer*.
- 4.6.7 Within three months from the date of notification by the **IESO**, a *metered market participant* shall make a *metering installation* fully compliant with the *metering installation* standards specified elsewhere in Chapter 6 if the *energy threshold* recorded by the standalone *meter* exceeds 17 gigaWatt-hours per annum.

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R01		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	Revenue Metering Performance		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	6	Appendix:	
Sections:	11.1		
Sub-sections proposed for amending:	11.1.2.2b		

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Consequential to the market rule amendments proposed in MR-00261-R00 there is an amendment required in section 11 of Chapter 6. The proposed cross-reference specifies that for a metering installation registered in accordance with the proposed section 4.6 a metered market participant shall not be required under the market rules to have an emergency restoration plan for the instrument transformer.

Background

Please refer to MR-00261-R00.

Discussion

In sub-section 4.6.3 as proposed in MR-00261-R00 it is specified there would be no obligation for the meter service provider to provide an emergency instrument transformer (IT) restoration plan. A restoration plan entails maintaining spare Instrument Transformers which may be expensive for small facilities therefore the proposed market rule amendment will reduce the entry cost of these small facilities joining the IESO-administered markets thus eliminating this as a barrier to market entry.

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11. Performance of Metering Installation

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11.1.2 Where **either** a *metered market participant* or a *metering service provider* becomes aware that a *metering installation* in respect of which it is the *metered market participant* or the *metering service provider* has gone out of service, is defective or malfunctions, ~~the metered market participant or the metering service provider, as the case may be, it~~ shall notify the **IESOMO** of the *outage*, defect or malfunction within 1 *business day* of becoming aware of same. In addition, the *metered market participant* shall:

11.1.2.1 where the *outage*, defect or malfunction relates to any portion of the *metering installation* other than an *instrument transformer*, ensure that

the *metering installation* or the defective portion thereof is replaced or repairs are made to the *metering installation* as soon as practicable and in any event within 2 *business days* of the date of the notice referred to in section 11.1.2 or within such longer period of time as may be agreed by the [IESOMO](#); and

- 11.1.2.2 where the *outage*, defect or malfunction relates to an *instrument transformer*:
- a. ensure that the *instrument transformer* is replaced as soon as practicable and in any event within 12 weeks of the date of the notice referred to in section 11.1.2 or within such longer period of time as may be agreed by the [IESOMO](#); and
 - b. [subject to section 4.6](#), ensure that the emergency restoration plan referred to in section 1.3.2.17 of Appendix 6.5 is implemented within 2 *business days* of the date of the notice referred to in section 11.1.2 and remains in effect until such time as the *instrument transformer* has been replaced.

PART 5 – IMO BOARD COMMENTS

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R02		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	Testing of Revenue Metering		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	6	Appendix:	6.3
Sections:	1.2 and 1.5		
Sub-sections proposed for amending:	1.2.1; 1.5.3 (new)		

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Consequential to the market rule amendments proposed in MR-00261-R00 there is an amendment required in section 1.2.1 of Appendix 6.3. The proposed cross-reference specifies that in accordance with the proposed section 4.6.6 the metering installation would not be required to meet the testing requirements set out in section 1.2 of Appendix 6.3. Specifically for metering installations registered in accordance with the proposed section 4.6 there would be no requirement for on-site reconciliation of these installations.

In addition, it is proposed to modify other testing and inspection requirements for these metering installations. Specifically a meter spot check for recorded active and reactive demands referenced in Appendix 6.3, section 1.3.1 shall be performed once every 3 years for meters registered under section 4.6 of Chapter 6.

It is also proposed that all references in the Chapter 6 appendices to the IMO be changed to the IESO in order to align the market rules with the name change under Bill 100.

Background

Please refer to MR-00261-R00.

Discussion

MR-00261-R00 proposes to permit the use of standalone conforming meters for small facilities. These meters already allow the IESO to retrieve and verify data submitted by these meters therefore an obligation for on-site reconciliation for these meters would only duplicate an information collection mechanism made possible by the meter technology. In essence obligating a duplicative test for these metering installations would only create additional costs for these small facilities without providing any specific benefits to the IESO-administered markets. Therefore removing this obligation will reduce the entry cost of these small facilities joining the IESO-administered markets thus eliminating this as a barrier to market entry (refer to revised section 1.2.1 below).

It is proposed to only require active and reactive demand spot testing once every three years for these metering installations (refer to new section 1.5.3). This frequency is judged appropriate given the small amounts being measured and the accuracy of main and alternate meters compared to legacy meters.

It is proposed to require current and voltage tests once every six months (new section 1.5.4) for a metering installation registered under section 4.6 of Chapter 6 that consists of an alternate meter. This increased requirement in comparison to a main/alternate metering installation would offset the loss of accuracy and redundancy that is afforded by a single alternate meter installation. The metering service provider would be permitted to perform this test remotely, if possible, as a way of reducing its costs.

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Appendix 6.3 – Inspecting and Testing Requirements

1.2 On-Site Reconciliation and Meter Register Dial Readings

- 1.2.1 Subject to [section 4.6.5 of Chapter 6 and](#) section 1.2.3, on-site reconciliation shall be conducted to confirm whether the *energy* measured by a *meter* over a given period of time was accurately transmitted to the *meter's data logger* within the *meter*.

1.5 Frequency of Routine Testing

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1.5.3 Each *metering service provider* shall conduct the routine tests specified in section 1.3.1, for each *metering installation* that is registered under section 4.6 of Chapter 6 for which it acts as a *metering service provider*, once every 3 years following the date of registration of the *metering installation*.

1.5.4 Each *metering service provider* shall test the currents and voltages applied to a *meter*, for each *metering installation* that is comprised of an alternate *meter* and that is registered under section 4.6 of Chapter 6 for which it acts as a *metering service provider*, once every 6 months following the date of registration of the *metering installation*. This test may be conducted by remote means if the *meter* is capable of transmitting the applied currents and voltages.

PART 5 – IMO BOARD COMMENTS

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R03		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	IESO Monitoring Requirements: Generators		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	4	Appendix:	4.15
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IMO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IMO-administered markets*.

Summary

Facilities connected to the IESO-controlled grid and participating in the IESO-administered markets are required to provide telemetered quantities laid out in Appendices 4.15 and 4.18 at performance levels detailed in Appendices 4.19 and 4.23. The IESO uses this telemetered data for security assessment of the IESO-controlled grid and to effect dispatch of resources participating in the IESO-administered markets. It is proposed to amend the market rules in Appendix 4.15 to specify a more relaxed standard for the provision of monitoring information for a minor generation facility that is embedded in a distribution system.

It is also proposed that all references in the Chapter 4 appendices to the IMO be changed to the IESO in order to align the market rules with the name change under Bill 100.

Background

Traditionally small embedded facilities have had to meet the same technical standards as connected facilities based solely on size. The market rule amendments proposed in MR-00261-R03-06 align the requirements with the impact that small embedded facilities have on the reliable operation of the grid. The relaxation of performance standards allows access to new technologies that significantly lower the cost of market entry for small distributed resources. The proposed amendments retain the right for the IESO to enforce a higher standard for performance where reliability is impacted. For further information please refer to MR-00261-R00.

Discussion

It is proposed to Amend Appendix 4.15 to create a standard for embedded minor facilities. Specifically it is proposed to permit these facilities to provide to the IESO megawatts and the status of the unit synchronizing breaker on an aggregated basis and to require the provision of megaVARs only where designated by the IESO for reliability reasons.

PART 4 – PROPOSED AMENDMENT

Appendix 4.15 – ~~IMO~~-IESO Monitoring Requirements: Generators

The following information, as a minimum, shall be available on a continual basis to the ~~IMO~~ IESO from:

- (a) any *generator* (i) whose *generation facility* is *connected* to the ~~IMO~~ IESO-controlled grid, or (ii) that is participating in the ~~IMO~~ IESO-administered markets; and
- (b) any *embedded generator* (i) that is not a *market participant* or whose *embedded generation facility* is not a *registered facility*; (ii) whose *embedded generation facility* includes a *generation unit* rated at greater than 20 MVA or that comprises *generation units* the ratings of which in the aggregate exceeds 20 MVA; and (iii) that is designated by the ~~IMO~~ IESO for the purposes of section 7.3.1 of this Chapter as being required to provide such data in order to enable the ~~IMO~~ IESO to maintain the *reliability* of the ~~IMO~~ IESO-controlled grid.

TYPE	INFORMATION REQUIREMENTS
Major generation facility	<p>Monitored Quantities</p> <p>1. Active Power (MW) and Reactive Power (MX)</p> <p>a) The standard requirement for active and reactive power is the provision of <i>net MW and net or gross MX</i>. <i>Gross MW and gross or net MX</i> are also to be provided, if designated by the IMO IESO as required for:</p> <ul style="list-style-type: none"> (i) determination of operating <i>security limits</i>; (ii) to maintain <i>reliable</i> operation of the IMO IESO-controlled grid; (iii) for compliance monitoring purposes; or (iv) if provision of only the standard requirement values as defined above would have a negative impact on other <i>market participants</i> through reduced operating <i>security limits</i>. <p>b) For <i>generation units</i> rated greater than or equal to 100 MVA, the standard requirement as defined in part a) for each <i>generation unit</i> shall be provided, and <i>gross MW and gross or net MX</i> for each <i>generation unit</i> shall be provided if designated by the IMO IESO as required using the criteria listed above in part a).</p> <p>c) For <i>generation units</i> rated at less than 100 MVA:</p> <ul style="list-style-type: none"> (i) for a group of <i>generation units</i> if those <i>generation units</i> are similar in size and operating characteristics, the standard requirement as defined in part a) shall be provided as a total for these <i>generation units</i>, and total <i>gross MW and gross or net MX</i> shall be provided if designated by the IMO IESO as required using the criteria listed above in part a); or (ii) if designated by the IMO IESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the IMO IESO-controlled grid or for compliance monitoring purposes, the standard requirement as defined in part a) for each <i>generating unit</i> shall be provided, and <i>gross MW and gross or net MX</i> for each <i>generation unit</i> shall be provided if designated by the IMO IESO as required using the criteria listed above in part a).

TYPE	INFORMATION REQUIREMENTS
	<p>d) For <i>generation facilities</i> that have been aggregated pursuant to Chapter 7 section 2.3:</p> <ul style="list-style-type: none"> (i) the standard requirement as defined in part a) shall be provided as an aggregated total, and an aggregated total <i>gross MW and gross</i> or <i>net MX</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a); or (ii) if so designated by the IMOIESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the IMOIESO-controlled <i>grid</i> or for dispatch compliance monitoring purposes, the standard requirement as defined in part a) for each <i>generating unit</i> shall be provided, and <i>gross MW and gross</i> or <i>net MX</i> for each <i>generation unit</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a). <p>e) For frequency changers:</p> <ul style="list-style-type: none"> (i) total MW and MX at either frequency; or (ii) if so designated by the IMOIESO as required for determination of operating <i>security limits</i>, total MW and MX at both frequencies. <p>f) For synchronous condensers:</p> <ul style="list-style-type: none"> (i) total MX. <p>2. Voltage:</p> <ul style="list-style-type: none"> a) For each <i>generation unit</i>, unit terminal voltage, except if <i>generation units</i> are connected to a common low voltage bus section, then the bus section voltage is adequate for those <i>generation units</i>. <p>3. Frequency:</p> <ul style="list-style-type: none"> a) For each <i>generation unit</i> or <i>generation facility</i> providing <i>black start capability</i>, frequency of the applicable <i>generation unit</i> or <i>generation facility</i>. <p><u>4.</u> Equipment Status</p> <ul style="list-style-type: none"> 4a) Unit mode (i.e. generator, condenser, pump) for each generation unit capable of different modes of operation. 2b) AGC status for each generation unit providing AGC. 3c) AVR and Stabilizer Status for each generating unit with a rated capacity > 100 MVA. Stabilizer status reporting is only required if it can be switched off by <i>generation facility</i> personnel remotely or at the <i>facility</i>. 4d) AVR and Stabilizer status for each <i>generation unit</i> with a rated capacity < 100 MVA if the status of this equipment is designated by the IMOIESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the IMOIESO-controlled <i>grid</i>. Stabilizer status reporting is only required if it can be switched on or off by <i>market participant</i> operating personnel remotely or at the <i>facility</i>. 5e) Synchronizing Breaker status for each <i>generation unit</i>. Where a <i>generation facility</i> is designed such that no low voltage synchronizing breaker is installed for each <i>generation unit</i>, the status of the appropriate HV breaker(s) and disconnect switch(es) normally used to isolate the <i>generation unit</i> must be provided. Where this results in access to the majority of breakers on a bus, the status of the remainder of the breakers shall be provided to complete the bus configuration. <p>Where a <i>generation facility</i> is designed such that there are disconnect switches in parallel, or directly in series, with the synchronizing breaker, the status of those switches is also required.</p> <ul style="list-style-type: none"> 6-f) <i>Special Protection System</i> status for each applicable <i>generation unit</i>.
<p><i>Significant generation facility and minor generation facility connected to IESO-controlled grid</i></p>	<p>Monitored Quantities</p> <p>1. Active Power (MW) and Reactive Power (MX):</p> <ul style="list-style-type: none"> a) The standard requirement for active and reactive power is the provision of <i>net MW and net</i> or <i>gross MX</i>. <i>Gross MW and gross</i> or <i>net MX</i> are also to be provided, if designated by the IMOIESO as required for: <ul style="list-style-type: none"> (i) determination of operating <i>security limits</i>;

TYPE	INFORMATION REQUIREMENTS
	<p>(ii) to maintain <i>reliable</i> operation of the IMOIESO-controlled grid;</p> <p>(iii) for compliance monitoring purposes; or</p> <p>(iv) if provision of only the standard requirement values as defined above would have a negative impact on other <i>market participants</i> through reduced operating <i>security limits</i>.</p> <p>b) For <i>generation facilities</i> that have not been aggregated units pursuant to Chapter 7 section 2.3:</p> <p>(i) for a group of <i>generation units</i> if those <i>generation units</i> are similar in size and operating characteristics, the standard requirement as defined in part a) shall be provided as a total for these <i>generation units</i>, and total <i>gross MW and gross or net MX</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a);</p> <p>(ii) if designated by the IMOIESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the IMOIESO-controlled grid or for compliance monitoring purposes, the standard requirement as defined in part a) for each <i>generating unit</i> shall be provided, and <i>gross MW and gross or net MX</i> for each <i>generation unit</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a).</p> <p>c) For <i>generation facilities</i> that have been aggregated pursuant to Chapter 7 section 2.3:</p> <p>(i) the standard requirement as defined in part a) shall be provided as an aggregated total, and an aggregated total <i>gross MW and gross or net MX</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a); or</p> <p>(ii) if so designated by the IMOIESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the IMOIESO-controlled grid or for dispatch compliance monitoring purposes, the standard requirement as defined in part a) for each <i>generating unit</i> shall be provided, and <i>gross MW and gross or net MX</i> for each <i>generation unit</i> shall be provided if designated by the IMOIESO as required using the criteria listed above in part a).</p> <p>d) For frequency changers:</p> <p>(i) total MW and MX at either frequency; or</p> <p>(ii) if so designated by the IMOIESO as required for determination of operating <i>security limits</i>, total MW and MX at both frequencies.</p> <p>e) For Synchronous Condensers:</p> <p>(i) Total MX.</p> <p>2. Voltage:</p> <p>a) For <i>generation units</i> that are VAR dispatchable, unit terminal voltage, except if the <i>generation units</i> are connected to a common low voltage bus section, then the bus section voltage is adequate for those <i>generation units</i>.</p> <p>3. Frequency:</p> <p>a) For each <i>generation unit</i> or <i>generation facility</i> providing <i>black start capability</i>, frequency of the applicable <i>generation unit</i> or <i>facility</i>.</p> <p><u>4.</u> Equipment Status</p> <p>4a) Unit mode (i.e. generator, condenser, pump) for each <i>generation unit</i> capable of different modes of operation.</p> <p>2-b) AVR and Stabilizer Status for each <i>generation unit</i> if the status of this equipment is designated by the IMOIESO as required for determination of operating <i>security limits</i> or to maintain <i>reliable operation</i> of the IMOIESO-controlled grid. Stabilizer status reporting is only required if it can be switched on or off by <i>market participant</i> operating personnel remotely or at the <i>facility</i>.</p> <p>3-c) Synchronizing Breaker Status for each <i>generation unit</i>. Where a <i>generation facility</i> is designed such that no low voltage synchronizing breaker is installed for each <i>generation unit</i>, the status of the appropriate HV breaker(s) and disconnect switch(es) normally used to isolate the <i>generation unit</i> must be provided. Where this results in access to the majority of breakers on a bus, the status of the remainder of the breakers shall be provided to complete the bus configuration.</p> <p>—Where a <i>generation facility</i> is designed such that there are disconnect switches in parallel, or directly in series, with the synchronizing breaker, the status of those switches is also required.</p>

TYPE	INFORMATION REQUIREMENTS
	<p><u>4-d)</u> <i>Special Protection System</i> status for each applicable <i>generation unit</i>.</p>
<p><i>Self-scheduling generation facility</i> with a name-plate rating of less than 10 MW</p>	<p>None</p>
<p><i>Intermittent and transitional scheduling generator</i></p>	<ul style="list-style-type: none"> • if a <i>major generation facility</i>, as described above for a <i>major generation facility</i> • if a <i>significant generation facility</i>, as described above for a <i>significant generation facility</i> • if a <i>minor generation facility</i>, as described above for a <i>minor generation facility</i> if designated by the IMO<i>IESO</i> at the time of registration as affecting the reliability of the IMO<i>IESO</i>-controlled grid • if a <i>small generation facility</i>, none
<p><i>Small generation facility</i></p>	<p>None</p>
<p><u><i>Minor generation facility that is embedded in a distribution system and registered as a dispatchable generator</i></u></p>	<ul style="list-style-type: none"> • <u>Total active power (MW) output of the individual generation unit or of the aggregated resource</u> • <u>Unit status if the facility is comprised of a single generation unit.</u> • <u>Aggregated resource status if the facility is comprised of aggregated resources, i.e. if at least one unit of the aggregated resource is synchronized, the aggregated resource is synchronized or if no unit in the aggregated resource is synchronized, the aggregated resource is not synchronized.</u> • <u>Reactive Power (MX) output, if requested by the <i>IESO</i> for reliable operation of the <i>IESO</i>-controlled grid, of individual <i>generation units</i> or of the aggregated resource.</u>

PART 5 – IMO BOARD COMMENTS

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R04		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	Monitoring Requirements – Embedded Loads		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	4	Appendix:	4.18
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Facilities connected to the IESO-controlled grid and participating in the IESO-administered markets are required to provide telemetered quantities laid out in Appendices 4.15 and 4.18 at performance levels detailed in Appendices 4.19 and 4.23. The IESO uses this telemetered data for security assessment of the IESO-controlled grid and to effect dispatch of resources participating in the IESO-administered markets. It is proposed to amend the market rules in Appendix 4.18 to specify a more appropriate standard for the provision of monitoring information for a load facility that is embedded in a distribution system.

Background

Traditionally small embedded facilities have had to meet the same technical standards as connected facilities based solely on size. The market rule amendments proposed in MR-00261-R03-06 align the requirements with the impact that small embedded facilities have on the reliable operation of the grid. The specification of more appropriate performance standards allows access to new technologies that significantly lower the cost of market entry for small distributed resources. The proposed amendments retain the right for the IESO to enforce a higher standard for performance where reliability is impacted. For further information please refer to MR-00261-R00.

Discussion

It is proposed to amend Appendix 4.18 to specify that dispatchable load facilities embedded in a distribution system would only be required to provide megaVARs information to the IESO if required for reliability.

PART 4 – PROPOSED AMENDMENT

Appendix 4.18 – ~~IESMO~~ Monitoring Requirements: Embedded Load Consumers

The following information, as a minimum, shall be available on a continual basis to the *IESMO* from all *embedded load consumers* designated by the *IESMO* pursuant to section 7.6.1. Needs of the state estimation process or other reasons may result in additional requirements. The direction of all real and reactive power flows shall be indicated measurements. An *embedded load consumer* that is also a *generator* shall also comply with the applicable requirements of Appendix 4.15.

TYPE	SIZE	MONITORED QUANTITIES
<i>Dispatchable load</i>		<ul style="list-style-type: none"> Megawatts (MW), megavars (MVAR) as designated by the IESO as required to maintain reliable operation of the IESO-controlled grid. phase to phase voltages as specified by the <i>IESMO</i>, and status of breakers or isolating switches for low voltage capacitors that are part of the <i>IESMO-controlled grid</i> or that are subject to a <i>contracted ancillary services</i> contract including by means or within the scope of an agreement similar in nature to an operating agreement entered into with the embedded load consumer
<i>Non-dispatchable load</i>	For a <i>non-dispatchable load facility</i> that includes a <i>non-dispatchable load</i> rated at 20 MVA or higher or that is comprised of <i>non-dispatchable loads</i> the ratings of which in the aggregate equals or exceeds 20 MVA	Where directed by the <i>IESMO</i> if <i>transmitter</i> or <i>distributor</i> data is not sufficient, <ul style="list-style-type: none"> MW, MVAR, phase to phase voltages as specified by the <i>IESMO</i> ; and status of breakers or isolating switches for low voltage capacitors that are part of the <i>IESMO-controlled grid</i> or that are subject to a <i>contracted ancillary services</i> contract including by means or within the scope of an agreement similar in nature to an operating agreement entered into with the embedded load consumer

PART 5 – IMO BOARD COMMENTS

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R05		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	IESO Monitoring Requirements – Generator Performance Standards		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	4	Appendix:	4.19
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Facilities connected to the IESO-controlled grid and participating in the IESO-administered markets are required to provide telemetered quantities laid out in Appendices 4.15 and 4.18 at performance levels detailed in Appendices 4.19 and 4.23. The IESO uses this telemetered data for security assessment of the IESO-controlled grid and to effect dispatch of resources participating in the IESO-administered markets. It is proposed to amend the market rules in Appendix 4.19 to specify a more appropriate standard for the provision of monitoring information for an embedded minor generation facility.

Background

Traditionally small embedded facilities have had to meet the same technical standards as connected facilities based solely on size. The market rule amendments proposed in MR-00261-R03-06 align the requirements with the impact that small embedded facilities have on the reliable operation of the grid. The specification of more appropriate performance standards allows access to new technologies that significantly lower the cost of market entry for small distributed resources. The proposed amendments retain the right for the IESO to enforce a higher standard for performance where reliability is impacted. For further information please refer to MR-00261-R00.

Discussion

It is proposed to amend Appendix 4.19 to specify for embedded minor generation facilities data measurement and equipment status change information may be provided to the IESO less than one minute from change in field condition unless otherwise required by the IESO.

PART 4 – PROPOSED AMENDMENT

Appendix 4.19 – ~~IESMO~~ Monitoring Requirements: Generator Performance Standards

The following performance standards, as a minimum, shall be achieved on a continual basis by all *generators* referred to in section 7.3.1 of this Chapter when monitored by the *IESMO*. Needs of the state estimation process or other reasons may result in additional requirements. The direction of all real and reactive power flows shall be indicated measurements.

FUNCTION	<i>Major generation facility or significant generation facility</i> (High Performance)	<i>Minor generation facility and intermittent generator or transitional scheduling generator</i> designated pursuant to section 7.3.2.3 (Medium Performance)	Small generation facility
Data measurements available at the <i>IESMO</i> communications interface	Less than 2 seconds from change in field monitored quantity	<ol style="list-style-type: none"> 1. Less than 10 seconds from change in field monitored quantity <u>or</u> 2. <u>If the <i>minor generation facility</i> is embedded within a <i>distribution system</i>, less than one minute from change in field monitored quantity unless otherwise designated by the <i>IESO</i> to maintain the <i>reliability</i> of the <i>IESO</i>- controlled grid.</u> 	Not applicable

FUNCTION	Major generation facility or significant generation facility (High Performance)	Minor generation facility and intermittent generator or transitional scheduling generator pursuant to section 7.3.2.3 (Medium Performance)	Small generation facility
Equipment status change available at the IESMO communications interface	Less than 2 seconds from field status change	1. Less than 10 seconds from field status change or 2. If the minor generation facility is embedded within a distribution system, less than one minute from change in equipment status unless otherwise designated by the IESO to maintain the reliability of the IESO controlled grid.	Not applicable
IESMO scan period for data measurements	Maximum:* 4 seconds	Minimum:** 4 seconds	Not applicable
IESMO scan period for Equipment Status	Maximum:* 4 seconds	Minimum:** 4 seconds	Not applicable
Data Skew	Maximum: 4 seconds	Not applicable	Not applicable
IESMO AGC Control Output period	If not providing AGC: • Not applicable If providing AGC: • 2 seconds	Not applicable	Not applicable
AGC Control Output transmitted to AGC generation units after receipt from ES/IMO	If not providing AGC: • Not applicable If providing AGC: • Within 2 seconds of receipt of control signal	Not applicable	Not applicable

* The [IESMO](#) may scan more frequently than the maximum.

** The [IESMO](#) may scan less frequently than the minimum.

Note: *Intermittent generators cannot provide AGC or other ancillary services.*

PART 5 – IMO BOARD COMMENTS

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00261-R06		
Subject:	Technical and Metering Requirements for Small Embedded Facilities		
Title:	Monitoring Requirements – Embedded Load Performance Standards		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	4	Appendix:	4.23
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00261-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
Approved Amendment Effective Date:		

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Facilities connected to the IESO-controlled grid and participating in the IESO-administered markets are required to provide telemetered quantities laid out in Appendices 4.15 and 4.18 at performance levels detailed in Appendices 4.19 and 4.23. The IESO uses this telemetered data for security assessment of the IESO-controlled grid and to effect dispatch of resources participating in the IESO-administered markets. It is proposed to amend the market rules in Appendix 4.23 to specify a more appropriate standard for the provision of monitoring information for an embedded load facility.

Background

Traditionally small embedded facilities have had to meet the same technical standards as connected facilities based solely on size. The market rule amendments proposed in MR-00261-R03-06 align the requirements with the impact that small embedded facilities have on the reliable operation of the grid. The specification of more appropriate performance standards allows access to new technologies that significantly lower the cost of market entry for small distributed resources. The proposed amendments retain the right for the IESO to enforce a higher standard for performance where reliability is impacted. For further information please refer to MR-00261-R00.

Discussion

It is proposed to amend Appendix 4.23 to specify for embedded load facilities data measurement and equipment status change information may be provided to the IESO less than one minute from change in field condition unless otherwise required by the IESO.

PART 4 – PROPOSED AMENDMENT

Appendix 4.23 – IESMO Monitoring Requirements: Embedded Load Consumers Performance Standards

The following performance standards, as a minimum, shall be achieved on a continual basis by all *embedded load consumers* designated pursuant to section 7.6.1 when monitored by the *IESMO*. Needs of the state estimation process or other reasons may result in additional requirements. The direction of all real and reactive power flows shall be indicated measurements. An *embedded load consumer* that is also a *generator* shall also comply with the requirements of Appendix 4.19.

FUNCTION	Major Dispatchable Load Facility and Significant Dispatchable Load Facility (High Performance)	Minor Dispatchable Load Facility and Non-dispatchable Load Facility*** that includes a non-dispatchable load rated at 20 MVA or higher or is comprised of non-dispatchable loads the ratings of which in the aggregate equals or exceeds 20 MVA (Medium Performance)
Data measurements available at the IESMO communications interface	Less than 2 seconds from change in field monitored quantity	<ol style="list-style-type: none"> 1. <u>Less than one minute from change in field monitored quantity; or</u> 2. <u>Less than 10 seconds from change in field monitored quantity if designated by the IESO as required to maintain reliable operation of the IESO-controlled grid.</u>
Equipment status change available at the IESMO communications interface	Less than 2 seconds from field status change	<ol style="list-style-type: none"> 1. <u>Less than one minute from change in field monitored quantity; or</u> 2. <u>Less than 10 seconds from field status change if designated by the IESO as required to maintain reliable operation of the IESO-controlled grid.</u>
Data skew	Maximum:* 4 seconds	Not applicable
IESMO scan period for data measurements	Maximum:* 4 seconds	Minimum:** 4 seconds
IESMO scan period for equipment status	Maximum:* 4 seconds	Minimum:** 4 seconds

* The *IESMO* may scan more frequently than the maximum.

** The *IESMO* may scan less frequently than the minimum.

*** Where directed by *IESMO* if *transmitter* or *distributor* data is not adequate.

PART 5 – IMO BOARD COMMENTS

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