



Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00364-R00		
Subject:	Ancillary Services		
Title:	Allowing Non-Generation Resources to Provide Regulation		
Nature of Proposal:	<input type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	5	Appendix:	
Sections:	4.4		
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Draft for Technical Panel Review	October 14, 2009
2.0	Draft for Technical Panel Review	November 18, 2009
3.0	Publish for Stakeholder Review and Comment	November 26, 2009
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

This amendment would allow non-generation resources to provide regulation in the IESO-administered markets. Historically, this ancillary service has been provided exclusively by generation facilities with automatic generation control capability.

The North American Electric Reliability Corporation (NERC) and the Northeast Power Coordinating Council (NPCC) allow non-generation resources to provide regulation. Allowing alternative resources to provide regulation in Ontario is consistent with the principle that the market should provide for open non-discriminatory access by all who meet reasonable publicly stated standards.

Consequential amendments are also proposed to make the distinction between regulation (the ancillary service) and automatic generation control (a process used by generation units to provide that service).

Finally, several editorial type amendments are required throughout the market rules to italicize the word ‘regulation’ where its use conforms to the Chapter 11 definition.

Background

Refer to MR-00364-Q00

Discussion

It is proposed to amend section 4.4.1 of Chapter 5 of the market rules by removing the specific reference that regulation is provided by generation resources. The IESO is obligated to meet the applicable reliability standards regardless of the type of resource providing regulation. Similarly, section 4.4 .4 need not specify the signals sent to different resource types.

It is also proposed to delete references to AGC where they appear with the word ‘regulation’ because these terms are not synonyms; regulation is a service whereas AGC is a process used by generation units to provide that service.

PART 4 – PROPOSED AMENDMENT**4.4 Regulation/~~Automatic Generation Control Service~~**

- 4.4.1 The *IESO* shall maintain sufficient ~~generation responsive to automatic generation control (AGC)~~regulation to allow the *IESO* to meet all applicable *reliability standards*.

- 4.4.2 The *IESO* shall determine the quantity of *regulation* capacity needed for each hour of the following day. As a minimum, the requirement shall be +/- 100 MW, with a ramp rate of 50 MW/min.
- 4.4.3 If the *IESO* is unable to comply with applicable *reliability standards*, it shall take corrective action to achieve compliance with applicable *reliability standards* within three months.
- 4.4.4 *Area control error (ACE)* shall be calculated by the *IESO* in accordance with section 4.4.5 and all applicable *reliability standards*. Control signals shall be sent from the *IESO* to ~~raise or lower the output of~~ registered facilities providing *regulation/AGC service*, as required by the *IESO*.
- 4.4.5 The calculation of *ACE* shall occur at least every four seconds.

PART 5 – IESO BOARD DECISION RATIONALE

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00364-R01		
Subject:	Ancillary Services		
Title:	Allowing Non-Generation Resources to Provide Regulation		
Nature of Proposal:	<input type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	7	Appendix:	
Sections:	9.2		
Sub-sections proposed for amending:	9.2.2.1		

PART 2 – PROPOSAL HISTORY - REFER TO MR-00364-R00

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

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

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- 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

Refer to MR-00364-R00

Background

Refer to MR-00364-R00

Discussion

It is proposed to amend section 9.2.2.1 of Chapter 5 of the market rules by removing the specific reference that regulation is provided by generation units. This amendment is required to enable the provision of regulation by non-generation resources.

PART 4 – PROPOSED AMENDMENT

9.2.2 Subject to section 4.8A.2 of Chapter 5, the principal *contracted ancillary services* that the *IESO* will procure pursuant to section 9.2.1 are:

9.2.2.1 *regulation*: this *ancillary service* allows total system generation to match total system load (plus losses) minute-by-minute or even second-by-second as required on an electricity grid. ~~This ancillary service is provided by generation units with automatic generation control (AGC) capability;~~

PART 5 – IESO BOARD DECISION RATIONALE

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00364-R02		
Subject:	Ancillary Services		
Title:	Allowing Non-Generation Resources to Provide Regulation		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	11	Appendix:	
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – REFER TO MR-00364-R00

Version	Reason for Issuing	Version Date
Approved Amendment Publication Date:		
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PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

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- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
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Summary

Refer to MR-00364-R00

Background

Refer to MR-00364-R00

Discussion

Historically, the term ‘regulation’ and ‘automatic generation control (AGC)’ have been used interchangeably since generation units were the only providers of regulation. It is proposed to amend the definition of regulation to describe the service without specifying how that service is provided.

Two additional amendments to definitions are proposed:

- Clarify that AGC is a process used by generation units providing regulation; and
- Replace ‘frequency control’ with the defined term ‘regulation’ in the ancillary services definition.

PART 4 – PROPOSED AMENDMENT

ancillary service means services necessary to maintain the *reliability* of the *IESO-controlled grid*, including, but not limited to, ~~frequency control~~ regulation, *black start capability*, *voltage control*, *reactive power*, *operating reserve* and any other such services established by the *market rules*;

automatic generation control or *AGC* means the process that automatically adjusts the output from a *generation facility* that is providing regulation based on automated, electronic signals in order to provide frequency control and to maintain the balance between load and the output from generation facilities;

regulation means, ~~in relation to a generation unit~~, the service required to control power system frequency and maintain the balance so that any power system frequency variations or imbalances between load and the output from generation facilities can be corrected ~~generation~~;

PART 5 – IESO BOARD DECISION RATIONALE

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00364-R03		
Subject:	Ancillary Services		
Title:	Allowing Non-Generation Resources to Provide Regulation		
Nature of Proposal:	<input type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	5, 7, 11	Appendix:	
Sections:			
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – REFER TO MR-00364-R00

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

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

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- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
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Summary

Refer to MR-00364-R00

Background

Refer to MR-00364-R00

Discussion

This editorial type amendment proposes to italicize all uses of Chapter 11 defined terms regarding regulation. The proposed changes are highlighted for ease of reference.

PART 4 – PROPOSED AMENDMENT**Chapter 5, section 4.10****4.10 Consequences of Failure to Pass a Test**

- 4.10.1 If an *ancillary service provider's registered facility* fails a test performed pursuant to section 4.9.1 or 4.9.2 in respect of an *ancillary service*, the *IESO* shall not schedule such *ancillary services* from such *registered facility* until the *ancillary service provider* demonstrates that it can provide the relevant *ancillary service*.
- 4.10.2 Without prejudice to the application of section 4.10.1, an *ancillary service provider* whose *registered facility* fails a test performed pursuant to section 4.9.1 or 4.9.2:
- 4.10.2.1 in the case of an *ancillary service provider* providing a *certified black start facility* or *regulation/AGC* under a *contracted ancillary service* contract:
- a. where there is sufficient information available to determine the date as of which the applicable *contracted ancillary service* was not provided, the *IESO* may require the *ancillary service provider*

- to refund the compensation it has received for such *contracted ancillary service* from such date to the date of the failed test; or
- b. in all other cases, the *ancillary service provider* shall provide such refund of compensation, if any, as may be specified in its *contracted ancillary service contract*;
- 4.10.2.2 in the case of an *ancillary service provider* providing a *certified black start facility or regulation* ~~AGC~~ under a *contracted ancillary service contract*, shall be subject to such penalties and sanctions as may be specified in its *contracted ancillary service contract*; and
- 4.10.2.3 in the case of any other *ancillary service provider*, shall be subject to financial penalties in accordance with section 6.6 of Chapter 3 and to such other sanctions as may be provided for in these *market rules*.

Chapter 7, sections 1.3.3 and 4.4.4

- 1.3.3 The *IESO* shall administer, in accordance with section 9, the following *procurement markets* to procure certain *physical services* required for *reliable* operation of the *electricity system*:
- 1.3.3.1 markets for *contracted ancillary services*, including *regulation*, *reactive support service* and *voltage control service*, and *black-start capability*; and
- 1.3.3.2 a market for *reliability must-run contracts*.
-
- 4.4.5 Constraints on the use of the *IESO-controlled grid* shall be determined on the basis of such system *security* requirements as the *IESO* may determine necessary to maintain *reliable* system operations, which requirements shall include, at a minimum, the following:
- 4.4.5.1 the largest applicable *contingency events* and any increments above these required to satisfy applicable *reliability standards*;
- 4.4.5.2 *security* constraints on identified *facilities*;
- 4.4.5.3 minimum requirements for each class of *operating reserve*;
- 4.4.5.4 the *IESO's* commitments to neighbouring *transmission systems* for *operating reserves* and *regulation*;
- 4.4.5.5 the availability and need for *contracted ancillary services* and *reliability must-run resources*; and

4.4.5.6 *reliability* constraints associated with *interchange schedules* as referred to in section 4.4.4.3.

.....
Chapter 11

major generation facility means a *generation facility* that provides *regulation*/~~*automatic generation control service*~~; that includes a *generation unit* that is rated at 100 MVA or higher; that comprises *generation units* the ratings of which in the aggregate equals or exceeds 100 MVA; or that is re-classified as a *major generation facility* pursuant to section 1.5.1 of Appendix 2.2 of Chapter 2 or section 7.8.1 of Chapter 4;

procurement market means any one of the markets operated by the *IESO*, pursuant to Chapter 7, for contracted *ancillary services*, including *regulation*, *voltage control* and *reactive support services* and *black-start capability*, and for *reliability must-run contracts*;

PART 5 – IESO BOARD DECISION RATIONALE

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Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00364-R04		
Subject:	Ancillary Services		
Title:	Allowing Non-Generation Resources to Provide Regulation		
Nature of Proposal:	<input type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	3, 5	Appendix:	
Sections:	Various		
Sub-sections proposed for amending:			

PART 2 – PROPOSAL HISTORY – REFER TO MR-00364-R00

Version	Reason for Issuing	Version Date
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PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

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- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

Refer to MR-00364-R00

Background

Refer to MR-00364-R00

Discussion

Consequential amendment are required to delete references to AGC where used interchangeably with the word ‘regulation’ because these terms are not synonyms; regulation is a service whereas AGC is a process used by generation units to provide that service.

In addition, it is proposed to amend section 1.1.2 of Appendix 5.1 such that the requirements for providing regulation apply to any type of facility, not just directly connected generation facilities. In addition to allowing load facilities to provide regulation, this amendment would make it explicit that generation facilities embedded in the distribution system can provide regulation. Section 1.1.4 indicates that generation facilities provide regulation by increasing or decreasing output. Rather than specify the direction of the change (increases or decrease), it is proposed to simplify the provision by indicating that a regulation provider must adjust its output or consumption as specified in its regulation contract. This change would be applicable to any type of resource that provides regulation.

Facilities providing regulation must be capable of receiving control signals sent from the IESO at the rate of at least one signal every two seconds. This requirement is currently specified in Appendix 4.19: IESO Monitoring Requirements – Generator Performance Standards. Since this requirement would apply to any facility providing regulation (not just generation facilities), it is proposed to move this requirement to Appendix 5.1 (refer to new section 1.1.6).

PART 4 – PROPOSED AMENDMENT**Chapter 3, sections 6.2.1A and 7.1.1**

6.2.1A This section 6 shall not apply in respect of:

6.2.1A.1 a breach of any performance standard set forth in the *market rules*; or

6.2.1A.2 a failure to pass a test set forth in the *market rules* or, where applicable, the *Ontario power system restoration plan*,

by an *ancillary service provider* in the provision of *regulation*~~AGC~~ or *black start capability* under a *contracted ancillary service contract*, which shall be governed, by the provisions of section 7 and by the provisions of sections 4.10.2.1 and 4.10.2.2 of Chapter 5.

7.1.1 An ancillary service provider providing *regulation*~~AGC~~ or *black start capability* under a *contracted ancillary service contract* that:

7.1.1.1 breaches any performance standard set forth in the *market rules*; or

7.1.1.2 fails to pass a test set forth in the *market rules*, the *contracted ancillary service contract* or, where applicable, the *Ontario power system restoration plan*,

in respect of such *contracted ancillary service* shall be subject to such financial penalties and other *sanctions* as may be specified in the applicable *contracted ancillary service contract* and to the provisions of section 4.10.2.1 of Chapter 5.

Appendix 4.15 – IESO Monitoring Requirements: Generators

TYPE	INFORMATION REQUIREMENTS
<i>Major generation facility</i>	<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 <i>IESO</i> 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 <i>IESO-controlled grid</i>; (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 <i>IESO</i> 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 <i>IESO</i> as required using the criteria listed above in part a); or (ii) if designated by the <i>IESO</i> as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the <i>IESO-controlled grid</i> or for compliance monitoring purposes,

TYPE	INFORMATION REQUIREMENTS
	<p>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 <i>IESO</i> as required using the criteria listed above in part a).</p> <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 or net MX</i> shall be provided if designated by the <i>IESO</i> as required using the criteria listed above in part a); or (ii) if so designated by the <i>IESO</i> as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the <i>IESO-controlled 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 or net MX</i> for each <i>generation unit</i> shall be provided if designated by the <i>IESO</i> 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 <i>IESO</i> 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> <p>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> <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>generation facility</i>.</p> <p>4. Equipment Status</p> <ul style="list-style-type: none"> a) Unit mode (i.e. generator, condenser, pump) for each <i>generation unit</i> capable of different modes of operation. b) AGC status for each <i>generation unit</i> providing AGC regulation. c) AVR and Stabilizer Status for each <i>generating unit</i> 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>. d) 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 <i>IESO</i> as required for determination of operating <i>security limits</i> or to maintain <i>reliable</i> operation of the <i>IESO-controlled 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>. e) 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. 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. f) <i>Special Protection System</i> status for each applicable <i>generation unit</i>.

Appendix 4.19 – IESO Monitoring Requirements: Generator Performance Standards

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>IESO</i> communications interface	Less than 2 seconds from change in field monitored quantity	1. Less than 10 seconds from change in field monitored quantity or 2. 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-controlled grid</i> .	Not applicable
Equipment status change available at the <i>IESO</i> communications interface	Less than 2 seconds from field status change	1. Less than 10 seconds from field status change or 2. If the <i>minor generation facility</i> is embedded within a <i>distribution system</i> , less than one minute from change in equipment status unless otherwise designated by the <i>IESO</i> to maintain the <i>reliability</i> of the <i>IESO-controlled grid</i> .	Not applicable
<i>IESO</i> scan period for data measurements	Maximum:* 4 seconds	Minimum:** 4 seconds	Not applicable
<i>IESO</i> scan period for Equipment Status	Maximum:* 4 seconds	Minimum:** 4 seconds	Not applicable
Data Skew	Maximum: 4 seconds	Not applicable	Not applicable

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
<i>IESO AGC Control Output period</i> <u>Intentionally left blank – section deleted</u>	If not providing AGC: Not applicable If providing AGC: 2 seconds	Not applicable	Not applicable
<i>AGC Control Output transmitted to AGC generation units after receipt from IESO</i> <u>Intentionally left blank – section deleted</u>	If not providing AGC: Not applicable If providing AGC: Within 2 seconds of receipt of control signal	Not applicable	Not applicable

* The IESO may scan more frequently than the maximum.

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

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

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Chapter 5, sections 4.9.2 and 4.10.2

4.9 Auditing and Testing of Ancillary Services

4.9.1 The IESO shall test *facilities* that will or do provide *ancillary services* to the IESO-controlled grid. The IESO shall use such tests to determine whether to register each *facility* as a *registered facility* for the provision of *ancillary services* and to ensure that each applicable *registered facility* continues to meet the requirements for registration to provide the relevant *ancillary services*.

4.9.1.1 [Intentionally left blank]

4.9.1.2 [Intentionally left blank]

4.9.2 Tests of the *facilities* or *registered facilities* of *ancillary service providers* or of prospective *ancillary service providers* referred to in section 4.9.1 shall include, but not be limited to, testing in the manner set forth in this section 4.9.2, to determine whether the *ancillary service provider* can supply the *ancillary services* which it wishes to supply or has contracted or been registered to supply:

4.9.2.1 the *IESO* may test the synchronised *ten-minute operating reserve* capability of a *generation facility* by issuing unannounced *dispatch instructions* requiring the *generation facility* to ramp up to its ten-minute capability;

4.9.2.2 the *IESO* may test the non-synchronised *ten-minute operating reserve* capability of a *generation facility* or *dispatchable load* by issuing unannounced *dispatch instructions* requiring the *generation facility* or *dispatchable load* to come on line and ramp up or to reduce demand, in either case to its ten-minute capability;

4.9.2.3 the *IESO* may test the thirty-minute operating reserve capability of a *generation facility* or *dispatchable load* by issuing unannounced *dispatch instructions* requiring the *generation facility* or *dispatchable load* to come on line and ramp up or to reduce demand, in either case to its thirty-minute capability;

4.9.2.4 a *certified black start facility* must perform tests on auxiliary and control equipment and alternate sources of power in accordance with and using the testing criteria and testing frequency requirements specified in the *Ontario power system restoration plan*;

4.9.2.4A a *certified black start facility* must pass the tests required for *certified black start facilities* in accordance with and using the testing criteria specified in the *Ontario power system restoration plan*;

4.9.2.4B the *IESO* may direct line energization tests of a *certified black start facility* to determine whether the *certified black start facility* can energize a transmission path specified by the *IESO*;

4.9.2.5 the *IESO* may test the *reactive support and voltage control* that has been contracted from a *registered facility* that is a *generation facility* by issuing unannounced *dispatch instructions* requiring the *generation facility* to provide such support within its contracted capability; and

4.9.2.6 the *IESO* shall at least annually test a *registered facility* providing *regulation/AGC* for compliance with the performance standards referred to in sections 1.1.3 and 1.1.4 of Appendix 5.1 in accordance

with the testing procedures specified in the applicable *contracted ancillary services* contract.

Appendix 5.1 – Performance Standards for Ancillary Services

1.1 ~~Regulation~~/Automatic Generation Control (AGC)

- 1.1.1 A *registered facility* providing *regulation*/AGC shall submit to the energy management system referred to in section 12 of Chapter 5 the monitoring and control information required to be provided pursuant to Chapter 4.
- 1.1.2 The telemetering between the energy management system referred to in section 12 of Chapter 5 and a *registered facility* providing *regulation*/AGC shall indicate the net injection or withdrawal of the registered facility as a whole and whether the generation unit(s) within the registered facility are synchronised to the IESO-controlled grid or connected to a distribution system.
- ~~1.1.2.1 — synchronised with the IESO-controlled grid;~~
- ~~1.1.2.2 — selected to be on AGC;~~
- ~~and what is the net power output of the registered facility as a whole.~~
- 1.1.3 A *registered facility* providing *regulation*/AGC must achieve at least the ramp rate specified in its *contracted ancillary services* contract for the full amount of *regulation* capacity offered in such contract.
- 1.1.4 A *registered facility* providing *regulation*/AGC must be able to ~~increase~~ adjust its output or consumption at least at the ramp rate specified in its *contracted ancillary services* contract ~~up to the maximum and output minimum values specified in such contract and must be able to decrease its output at least at the ramp rate specified in its contracted ancillary services contract down to the minimum output specified in such contract.~~
- 1.1.5 No *registered facility* shall offer to provide *regulation* capacity that exceeds an amount equal to the *registered facility's* maximum ramp rate multiplied by ten minutes.
- 1.1.6 A registered facility providing regulation must be capable of receiving control signals sent from the IESO at the rate of at least one signal every two seconds.

PART 5 – IESO BOARD DECISION RATIONALE

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