Market Rules

Chapter 5
Power System Reliability - Appendices

Library Record No.	MDP_RUL_0002_05A
Document Name	Market Rules for the Ontario Electricity Market
Issue	Issue 3.0
Reason for Issue	Baseline 23.1
Effective Date	June 2, 2010

Document Change History

Issue/Draft	Reason for Issue	Date
Issue 1.0	Baseline 8.0	September 25, 2002
Issue 2.0	Baseline 22.0	September 9, 2009
Issue 3.0	Baseline 23.1	June 2, 2010

Related Documents

Library Record No.	Document Title	Version
MDP_RUL_0002	Market Rules for the Ontario Electricity Market	38.0

Document Control

Authorities

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Distribution List

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Appendix 5.1 – Peformance Standards for Ancillary Services

1.1 Regulation

1.1.1 A *registered facility* providing *regulation* 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* shall indicate:

1.1.2.1 whether the *registered facility* is synchronised to the *IESO-controlled grid* or connected to a *distribution system*;

1.1.2.2 whether the *registered facility* is providing *regulation* or not; and

1.1.2.3 the net injection or withdrawal of the *registered facility* as a whole.

1.1.3 A *registered facility* providing *regulation* 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* must be able to adjust its output or consumption at least at the ramp rate specified in its *contracted ancillary services* contract to the maximum and minimum values 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. If the *regulation* control signals are received by a control centre, the control centre must forward these signals to the *registered facility* providing *regulation* within two seconds of having received the signal from the *IESO*.

1.2 Operating Reserve

Ten-Minute Operating Reserve

1.2.1 An *ancillary service provider* offering *ten-minute operating reserve* shall ensure that the *registered facility*, or *registered facilities*, that it has scheduled to provide *ten-minute operating reserve* is available for *dispatch* as scheduled.

1.2.2 An *ancillary service provider* offering *ten-minute operating reserve* shall be capable of achieving at least the ramp rate stated in its *offer* for the full amount of *ten-minute operating reserve* offered.

1.2.3 When activated by the *IESO*, *ten-minute operating reserve* shall be available for dispatch for at least one hour.

Thirty-Minute Operating Reserve

1.2.4 An *ancillary service provider* offering *thirty-minute operating reserve* shall ensure that the *registered facility*, or *registered facilities*, that it has scheduled to provide *thirty-minute operating reserve* is available for *dispatch* as scheduled.

1.2.5 An *ancillary service provider* offering *thirty-minute operating reserve* shall be capable of achieving at least the ramp rate stated in its *offer* for the full amount of *thirty-minute operating reserve* offered.

1.2.6 When activated by the *IESO*, *thirty-minute operating reserve* shall be available for *dispatch* for at least one hour.

1.3 Reactive Support and Voltage Control – Generation Facilities

1.3.1 All *registered facilities* that are *generation facilities* providing *reactive support service* and *voltage control service* must be capable of meeting the requirements specified in Chapter 4.

1.3.2 Subject to section 1.3.6, *automatic voltage regulators* shall be in service and in automatic mode as indicated in Chapter 4 unless the *registered* facility that is a *generation facility* is specifically directed by the *IESO* to operate the *AVRs* in manual mode.

1.3.3 Subject to section 1.3.4, *registered* facilities that are *generation facilities* providing *reactive support service* and *voltage control service* shall be operated to within the standard power factor range described in Appendix 4.2 of Chapter 4.

1.3.4 The *IESO* may direct a *registered facility* that is a *generation facility* providing *reactive support service* and *voltage control service* to operate in an under- or over-excited state for a certain period of time in order to maintain prescribed voltages on the *IESO-controlled grid*. Such direction may require such *registered facility* to operate in the condense mode or to reduce real power output in order to increase its ability to provide reactive power.

1.3.5 Unless otherwise specified by the *IESO*, each *registered facility* that is a *generation facility* providing *reactive support service* and *voltage control service* shall respond to voltage or reactive power schedules immediately following receipt of the *IESO's* request. Where such *registered facility* cannot be *dispatched* as directed by the *IESO***,** the *ancillary service provider* shall immediately provide the *IESO* with notice to this effect.

1.3.6 Each *ancillary service provider* shall:

1.3.6.1 notify the *IESO* immediately upon the *forced outage* of the *AVR* at its *registered facility* that is a *generation facility* being forced out of service; or

1.3.6.2 for *planned outages*, prior to the *AVR* being removed from its *registered facility* that is a *generation facility* for maintenance, follow the procedures outlined in section 6.

1.3.7 Following a *contingency event*, each *registered facility* that is a *generation facility* shall automatically respond to provide or absorb the reactive power in accordance with the established maximum and minimum reactive power capabilities of such *registered facility*. Each *ancillary service provider* shall immediately notify the *IESO* whenever its *registered facility* that is a *generation facility* cannot perform to the established maximum and minimum reactive power capabilities of such *registered facility*.

1.4 Reactive Support and Voltage Control – Non-Generation Facilities

1.4.1 Except for *forced outages* and *planned outages* coordinated with the *IESO* pursuant to these *market rules*, each *transmitter* shall keep its transmission assets in service at all times unless released from service by the *IESO* or directed by the *IESO* to be removed from service pursuant to this section 1.4.

1.4.2 The *IESO* may direct a *transmitter* to remove transmission assets from service to the extent necessary to maintain reactive support and voltage control.

1.4.3 Each *connected wholesale customer*, *transmitter* and *distributor connected* to the *IESO-controlled grid* providing *reactive support service* and *voltage control service* shall respond immediately following receipt of a direction from the *IESO* with respect to directions concerning but not limited to, static capacitors, static VAR compensators and reactors. For directions concerning synchronous condensers, the response time will be as soon as practicable recognizing the device characteristics and operating state of the device at the time of receipt of the *IESO's* direction. Each such *ancillary service provider* shall immediately notify the *IESO* whenever the devices referred to in this section 1.4.3 cannot be switched in accordance with the *IESO* direction.

1.5 Black Start

1.5.1 A *certified black start facility* will be tested and/or assessed for its ability to comply with the performance standards as specified in its *contracted ancillary services* contract for *certified black start facilities.*

1.5.2 Prior to registering a *generation facility* as a *certified black start facility*, the *IESO* shall be satisfied that the *generator* has demonstrated through completion of tests and assessments that the *generation facility* can provide sufficient MWs and MVARs to:

1.5.2.1 energize or assist in energizing the specified transmission path within the applicable time period referred to in section 1.5.7;

1.5.2.2 provide *energy* requirements along such transmission path, including the requirements of any load connected to the transmission path; and

1.5.2.3 provide start-up power to the *generation facility* as specified by the *IESO* which will meet the objectives and priorities of the *Ontario power system restoration plan*.

1.5.3 A *certified black start facility* will be tested and/or assessed for its ability to maintain voltage within emergency voltage limits over a range of loading from no external load to full external load in accordance with *reliability standards*.

1.5.4 A *certified black start facility* must be equipped with governors that are capable of operating in an isochronous mode.

1.5.5 Adequate transmission capacity shall be available to connect the *certified black start facility* to the source providing station services to other specified generation stations referred to in 1.5.8.

1.5.6 A *generator* operating a *certified black start facility* shall make efforts consistent with *good utility practice* to comply with a direction from the *IESO* to deliver power without assistance from the electrical system unless:

1.5.6.1 the *certified black start facility* is on an *outage*, which *outage* is not a removal of the *certified black start facility* from service caused by the de-energization of the electrical network to which the *certified black start facility* is connected, or

1.5.6.2 where to do so would endanger the safety of any person, damage equipment, harm the environment or violate any applicable law, regulation, or operating limit.

1.5.7 A *certified black start facility* will be tested and/or assessed for its ability to start and energize the applicable transmission path specified in 1.5.2.1 as follows:

1.5.7.1 if the *certified black start facility* is comprised of a hydroelectric *generation unit* or a *generation unit* that generates using aero-derivative gas turbines, within 30 minutes of the initiation of the black start process;

1.5.7.2 if the *certified black start facility* is comprised of a *generation unit* that generates using industrial gas turbines, within 60 minutes of the initiation of the black start process;

1.5.7.3 if the *certified black start facility* is comprised of a *generation unit* that generates using hot, steam-driven turbines, within 2.5 hours of the initiation of the black start process; and

1.5.7.4 if the *certified black start facility* is in another operating state or is comprised of an unspecified technology, within such time as may be specified in its *contracted ancillary services* contract for *certified black start facilities*.

1.5.8 A *certified black start facility* will be tested and/or assessed for its ability to provide startup power for the period of time it takes to switch the applicable transmission path specified in section 1.5.2.1 into service and to complete the start-up process at the generating station specified in section 1.5.2.3.

1.5.9 A *certified black start facility*:

1.5.9.1 referred to in section 1.5.7.1, 1.5.7.2 or 1.5.7.3 will be tested and/or assessed for its ability to complete three successive starts within eight hours of the initiation of the black start process; or

1.5.9.2 referred to in section 1.5.7.4, will be tested and/or assessed for its ability to complete such number of successive starts within such period of time as may be specified in its *contracted ancillary services* contract for *certified black start facilities*.

1.5.10 A *certified black start facility* will be tested and/or assessed for its ability to produce the range of reactive power resources required by the *IESO-controlled grid* as described in Chapters 4, 5 and 7.

1.5.11 A *certified black start facility* must participate in the training activities and restoration drills referred to in sections 11.3.7.1 and 11.3.7.2, respectively.