ISO Rules
Part 300 System Reliability and Operations
Division 304 Routine Operations
Section 304.3 Wind and Solar Power Ramp Up Management

Applicability

1(1) Subject to subsections 1(2) and 1(3), Section 304.3 applies to:

(a) ~~(a)~~ the **legal owner** of a wind or solar **aggregated generating facility** that:

(i) is directly connected to the **interconnected electric system** or to an electric system within the service area of the City of Medicine Hat, including a wind or solar **aggregated generating facility** situated within an industrial complex that is directly connected to the **interconnected electric system** or to an electric system within the service area of the City of Medicine Hat; and ~~and that has a **gross real power** capability equal to or greater than 5 MW;~~

(ii) has a **gross real power** capability greater than or equal to 5 MW;

(b) ~~(b)~~ the **operator** of a wind or solar **aggregated generating facility** that:

(i) is directly connected to the **interconnected electric system** or to an electric system within the service area of the City of Medicine Hat, including a wind or solar **aggregated generating facility** situated within an industrial complex that is directly connected to the **interconnected electric system** or to an electric system within the service area of the City of Medicine Hat; and

(ii) ~~that~~ has a **gross real power** capability ~~equal to or~~ greater than or equal to 5 MW; and

(c) the **ISO**.

(2) The provisions of~~Except as otherwise specified herein,~~ this Section 304.3 do~~does~~ not apply to the **legal owner** of a~~following~~ wind or solar **aggregated generating facility** that was energized and commissioned after April 7, 2017 and that is identified~~**facilities**, as represented~~ by its~~their~~ **pool asset** description in an exemption list~~descriptions: Castle River #1 (CR1), Cowley Ridge (CRE3), Kettles Hill (KHW1), Suncor Magrath (SCR2), McBride Lake Windfarm (AKE1), Summerview 1 (IEW1), Bull Creek #1 (BUL1) and Bull Creek #2 (BUL2) (collectively referred to herein as~~ the **ISO** publishes on the AESO website. ~~"exempt facilities").~~

(3) The provisions of this Section 304.3 do not apply to the **legal owner** of a wind or solar~~an~~ **aggregated generating facility** that was energized and commissioned:

(a) ~~-~~prior to April 7, 2017; or

(b) that is included in the exemption list referenced in subsection 1(2) in accordance with a previous technical requirement, technical standard, **ISO rule** or functional specification;

~~,~~ but the **legal owner** of such an existing wind or solar **aggregated generating facility** must remain compliant with the ramp up management requirements set out in that previous technical requirement, technical standard, **ISO rule** or functional specification~~.~~

(4) Notwithstanding subsection 1(2) or 1(3), ~~)~~ undergoes one or more:

(a) facility additions after April 7, 2017 resulting in an increase in the cumulative **gross real power** capability of the wind or solar **aggregated generating facility** by an amount ~~equal to or~~ greater than or equal to 5 MW; or

(b) equipment replacements after April 7, 2017 where the equipment replaced has a **gross real power** capability ~~equal to or~~ greater than or equal to 5 MW irrespective of whether the cumulative **gross real power** capability of the wind or solar **aggregated generating facility**

is increased;

then the entire wind or solar **aggregated generating facility** will be subject to, and the **legal owner** of the wind or solar **aggregated generating facility** ~~and~~ must comply with the provisions of this Section 304.3.

(5) The **ISO** may, notwithstanding~~Notwithstanding~~ subsections 1(2), (3) and (4), ~~the **ISO** may~~ require the **legal owner** of a wind or solar **aggregated generating facility**~~, **transmission facility**~~ to comply with any one or more specific provisions~~provision~~ or all of the provisions of this Section 304.3, if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.

Requirements

Functional Specification

2(1) The **ISO** must, in accordance and generally consistent with this Section 304.3, approve a written functional specification containing details, work requirements, and specifications for the design, construction, and operation of a wind or solar **aggregated generating facility** and associated **transmission facility** connection facilities.

Real Power and Ramp Rate Limitations

3(1) The **legal owner** of a wind or solar **aggregated generating~~generation~~ facility** must ensure that the facility has the control capability to limit the **real power** output at the **point of connection**, or at the connection to the **electric distribution system**, in accordance with any limits or instructions contained in any **directive** ~~and must ensure that the **real power** output does not exceed the tolerances described in this subsection 3~~.

(2) The **legal owner** of a wind or solar **aggregated generating facility** must ensure that the **real power** control limit referred to in subsection 3(1) is adjustable from the minimum operating output to the **gross real power** capacity at an average resolution of 1 MW.

(3) ~~The**(3)** Subject to subsection 3(4), the~~ **legal owner** of a wind or solar **aggregated generating facility** must, when a **real power** control limit is in effect ~~in accordance with a **directive** and ambient conditions at the wind or solar **aggregated generation facility** result in increasing **real power** output~~, ensure that the ~~**real power** control limit of the wind and solar **aggregated generating facility** is capable of keeping the one (1)~~ minute average **real power** output does not exceed~~from exceeding~~ the **real power** control limit specified in the **directive** referred to in subsection 5(1) by more than~~, within~~ 2% of the **gross real power** capability.

(4) The **legal owner** of a wind or solar **aggregated generating facility** must ensure that~~, if changing ambient conditions result in the **real power** control limit set out in the **directive** referred to in subsection 3(3) being instantaneously exceeded, the **real power** output of the wind or solar **aggregated generating facility** at the **point of connection**, or the connection to the **electric distribution system**, must not exceed the **real power** control limit by more than 5% of the **gross real power** capability.~~

~~**(5)** The **legal owner** of a wind or solar **aggregated generating facility** must ensure that~~ the facility is equipped with **ramp rate** limiting controls that are:~~.~~

(a) ~~**(6)** The **legal owner** of a wind or solar **aggregated generating facility** must ensure that the **ramp rate** limiting controls referred to in subsection 3(5) are~~ capable of limiting the ramp up of the **real power** of the wind or solar **aggregated generating facility**; and~~, and that they are adjustable such that the **ramp rate** does not exceed, in MW per minute, a range equal to 5%~~

of the **gross real power** capability to 20% of the **gross real power** capability.

(b) adjustable such that the **ramp rate** does not exceed, in MW per minute, a range from 5% to 20% of the **gross real power** capability.

(5) The **legal owner** of a wind or solar **aggregated generating facility** must ensure that the default setting for the **ramp rate** limiting controls referred to in subsection 3(4) is set at 10% of the **gross real power** capability.

(6) The **legal owner** of a wind or solar **aggregated generating facility** must ensure that any difference between the **real power** at:

(a) the **point of connection** or the connection to the **electric distribution system** of the wind or solar **aggregated generating facility**, and

(b) any **collector busses** of the wind or solar **aggregated generating facility**,

is compensated for in the **real power** limiting and **ramp rate** limiting controls.

Use of the Energy Market Merit Order

4 The **ISO** must implement the energy market **merit order** provisions of the **ISO rules** for energy balance to manage the ramp up of the total **real power** output from all wind or solar **aggregated generating facilities**, including the exempt facilities.

Calculation of the Alberta System Wind and Solar Aggregated Generating Facilities Power Limit

5(1) The **ISO** must calculate, at a minimum monitoring interval of every twenty (20) minutes, an Alberta system wind and solar power limit for wind and solar **aggregated generating facilities** power limit.

(2) The **ISO** must issue, at the start of each monitoring interval, **directives** by means of Supervisory Control and Data Acquisition signals to the **operator** of each wind or solar **aggregated generating facility**, specifying its wind and solar **aggregated generating facilities** power limit pro rata share.

Calculation and implementation of the Wind and Solar Aggregated Generating Facilities Power Limit Pro Rata Share

6(1) The **ISO** must, by means of supervisory control and data acquisition signals, issue **directives** to the **operator** of each wind or solar **aggregated generating facility** that includes their **facilities** power limit pro rata share.

(2) The **ISO** must optimize the pro rata share **directive** described in subsection 5(1), including reallocating any amount that results in a wind or solar **aggregated generating facility** exceeding its **maximum capability**. causes the wind or solar **aggregated generating facility** to exceed its **maximum capability**, reallocate the difference in MW on a pro rata basis to all other wind and solar **aggregated generating facilities**.

(2) The **operator** of a wind or solar **aggregated generating facility** that receives:

(a) a pro rata share Supervisory Control and Data Acquisition **directive** signal under subsection 5(2); and

(b) a curtailment **directive** for any other reason;

must comply with the subsection 6(2)(b) curtailment **directive**.

(3) The **ISO** must, where the **operator** of a wind or solar **aggregated generating facility** receives both

~~of the **directives** described in subsection 6(2), reallocate any difference in MW between the pro rata share **directive** and the curtailment **directive** to all other wind and solar **aggregated generating facilities**.~~

Methodology Used to Calculate the Alberta System Wind and Solar ~~Aggregated Generating Facilities~~ Power Limit and the Wind and Solar Aggregated Generating Facilities Power Limit Pro Rata Share

~~6~~7 **(1)** The **ISO** must post the methodology used to calculate the Alberta system wind and solar power limit and the methodology used to calculate the Alberta system wind and solar **aggregated generating facilities** power limit pro rata share~~and methodology used to calculate the pro rata share of the Alberta system wind and solar **aggregated generating facilities** power limit~~ to the AESO website.

(2) The **ISO** must~~, to amend the methodology used to calculate the Alberta system wind and solar **aggregated generating facilities** power limit or methodology used to calculate the pro rata share of the Alberta system wind and solar **aggregated generating facilities** power limit posted to the AESO website in accordance with subsection 7(1):~~

~~(a)~~ notify market participants at least ~~no less than thirty (~~30~~)~~ days in advance of amending the methodologies referenced in 6(1)~~the amended methodology~~ coming into effect~~; and~~

~~(b) post the amended methodology to the AESO website on the date the amended methodology comes into effect~~.

Revision History

Date	Description
xxxx-xx-xx	Completed administrative amendments to align with red tape reduction goals and ISO drafting principles; corrected typographical errors; and simplified provisions. Consolidated sections 3(4), 3(5), 5(2), 6(1) and 6(3). Removed subsection 3(4), 3(5), 4 and 6(2). .
2019-12-11	Removed duplication with new Section 103.14, *Waivers and Variances*; standardized functional specifications language; capitalized references to “Section”
2018-09-01	Revised the applicability section to include solar aggregated generating facilities and to apply to an aggregated generating facility that has a gross real power capability equal to or greater than 5 MW; added real power and ramp rate limitations requirements; revised the requirement to issue a power limit pro rata share from when a predetermined criterion is met to at the start of each monitoring interval; removed the methodologies used to calculate the Alberta system wind power limit and pro rata share; added subsection 7; revised subsection 4 to allow the energy market merit order provisions of the ISO rules and pro rata share to occur concurrently; and administrative amendments.
2015-04-01	Rule references have been updated in subsection 5(1)(a)
2015-04-01	The words “or dispatch” were added in subsection 5(1)(b).
2013-01-08	Previously defined terms have been un-defined and the words have been un-bolded.

2011-12-01	Initial release.