



Alberta Electric System Operator

Approval of Proposed Energy Storage Amendments to the ISO Rules

June 13, 2023

Alberta Utilities Commission
Decision 28176-D01-2023
Alberta Electric System Operator
Approval of Proposed Energy Storage
Amendments to the ISO Rules
Application 28176-A001
Proceeding 28176

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1 Introduction

1. On April 28, 2023, the Alberta Electric System Operator (AESO)¹ applied² to the Alberta Utilities Commission requesting approval of proposed amendments to multiple independent system operator (ISO) rules and definitions (collectively the proposed energy storage amendments, listed in their entirety in Appendix A), to be effective April 1, 2024. For the reasons that follow, the Commission approves the proposed energy storage amendments as submitted by the AESO.

2. The AESO submitted that, while the use of energy storage is not prohibited in the Alberta electricity industry, applicable statutes and regulations do not expressly recognize energy storage. Generally speaking, the AESO's current authoritative documents (including ISO rules and definitions) do not contemplate energy storage or fully consider the differences in the technical and operating characteristics of energy storage technologies (compared to other forms of load and generation).

3. To remedy these gaps, the AESO submitted the proposed energy storage amendments to clarify market participation and technical and operating requirements for all foreseeable forms of energy storage. As submitted by the AESO, the proposed energy storage amendments comprise changes that:

- (a) Clarify requirements for submitting bids in the energy market to allow energy storage to participate in the energy market;
- (b) Introduce Adjustment for Load on the Margin (ALM) as a payment mechanism to ensure that pool participants do not pay more than bid price for energy consumed;
- (c) Create technology-agnostic energy market ISO rules by removing technology-specific adjectives from market terminology;
- (d) Integrate energy storage into the existing ancillary services, system operations and loss factor ISO rules through new definitions;
- (e) Implement the technical and operating requirements for energy storage by incorporating new definitions and introducing new requirements; and
- (f) Retire existing definitions that are no longer required.

¹ The ISO is established under Section 7(1) of the *Electric Utilities Act*, and operates under the trade name AESO. For the purposes of this decision, AESO and ISO are used interchangeably.

² Application 28176-A001.

4. On May 3, 2023, the Commission issued a notice of application and requested the submission of statements of intent to participate (SIPs) by May 17, 2023.

5. The Consumers' Coalition of Alberta (CCA) submitted a SIP on May 2, 2023, stating that it had not identified any specific concerns with the proposed energy storage amendments,³ but wished to participate in any further process, particularly by responding to other parties' submissions. As no other parties submitted SIPs, the Commission determined that no further process was required.

6. The Commission considers that the record of this proceeding closed on May 17, 2023.

7. The Commission reviewed the entire record for this proceeding in coming to this decision; lack of reference to a matter addressed in evidence or argument does not mean that it was not considered.

2 Legislative and regulatory framework

8. Under Section 20.2(1) of the *Electric Utilities Act*, the AESO must apply to the Commission for approval of a proposed ISO rule.

9. After considering an ISO rule, in accordance with Section 20.21(1) of the *Electric Utilities Act*, the Commission may, by order, approve the ISO rule, direct the AESO to revise the ISO rule or refuse to approve the ISO rule.

10. In accordance with Section 20.21(2) of the *Electric Utilities Act*, the Commission may approve an ISO rule filed under Section 20.2 only if the Commission is satisfied:

- (a) that the ISO rule
 - (i) is not technically deficient,
 - (ii) supports the fair, efficient and openly competitive operation of the market to which it relates, and
 - (iii) is in the public interest,
 - [...]
- and
- © that the Independent System Operator, in developing the rule, complied with the Commission rules made under section 20.9.

11. Section 20.9 of the *Electric Utilities Act*, requires the Commission to make rules requiring the AESO to consult with parties in the development of ISO rules and permits the Commission to develop rules governing the AESO's process in the development of those ISO rules. Rule 017: *Procedures and Process for Development of ISO Rules and Filing of ISO Rules with the Alberta Utilities Commission*, is the Commission rule which was created in response to Section 20.9 of the *Electric Utilities Act*.

³ The Commission notes that the CCA expressed concerns that the AESO had "not put forward changes to the tariffs approved at the last General Tariff Application." As the ISO tariff was not part of the present proceeding, the Commission considers this concern to be out of scope.

3 Issues

3.1 Do the rule amendments meet the criteria set out in the Electric Utilities Act

12. The AESO requested that the Commission approve the proposed amendments to sections 202.6, 306.5 and 306.7 of the ISO rules pursuant to Section 20.21 of the *Electric Utilities Act*, having regard to each of the following factors, examined in detail in the sections that follow:⁴

- (a) The ISO rule is not technically deficient (Section 20.21(2)(a)(i) of the *Electric Utilities Act*).
- (b) The ISO rule supports the fair, efficient and openly competitive operation of the market to which it relates (Section 20.21(2)(a)(ii) of the *Electric Utilities Act*).
- (c) The ISO rule is in the public interest (Section 20.21(2)(a)(iii) of the *Electric Utilities Act*).

3.1.1 The ISO rule is not technically deficient

13. The AESO submitted that the proposed energy storage amendments:

- (a) Align with existing market participation concepts of dispatching and settling pool assets, and Payment to Supplies on the Margin (PSM).
- (b) Expand existing market participation and power pool settlement concepts to energy storage.
- (c) Resolve gaps in technical and operating requirements for synchronous forms of energy storage.
- (d) Remove ambiguity in definitions, thereby improving technical application of ISO rules.
- (e) Are clear and concise.

14. Further, in its own review, the Commission did not identify any technical concerns with the proposed energy storage amendments.

3.1.2 The ISO rule supports the fair, efficient and openly competitive operation of the market to which it relates

15. According to the AESO, the proposed energy storage amendments:

- (a) Remove barriers to entry, increase competition and ensure fairness due to technology-agnostic rules, which also apply consistently to ancillary services and the transmission loss factors framework;
- (b) Consistently apply the requirements for bidding to all sink assets;

⁴ Exhibit 28176-X0001, ES ISO Rule Amendments Application, PDF pages 22-29, paragraphs 83-103.

- (c) Bring additional liquidity to the market, leading to more efficient electricity prices, by incenting sink asset participation in the energy market;
- (d) Enhance symmetry in payments to source assets and sink assets (since the formula for ALM for sink assets is analogous to the PSM formula for source assets);
- (e) Provide the right settlement signal to incent demand participation, encouraging flexible consumption;
- (f) Avoid disincentives to bid in the energy market;
- (g) Ensure information related to the reliable operation of the Alberta Interconnected Electric System (AIES) is collected and shared in a common and consistent manner;
- (h) Promote fairness by removing ambiguity from technical and operating requirements for synchronous and asynchronous energy storage; and
- (i) Improve efficiency of the ISO rules by simplifying and reducing unused definitions.

3.1.3 The ISO rule is in the public interest

16. The AESO submitted that the proposed energy storage amendments:

- (a) Increase reliability and supply adequacy through bidding to provide priced demand response, by enabling new technologies to participate in merit order dispatch and by expanding and diversifying the supply mix;
- (b) Provide optionality and operational flexibility to pool participants with sink assets by allowing the option to avoid the administration of managing and maintaining a bid;
- (c) Remove regulatory uncertainty for energy storage and other future technologies by removing references to specific technology;
- (d) Promote grid stabilization, resilience, and reliability by enabling the participation of new technologies in ancillary services;
- (e) Improve AIES operation reliability and safety by integrating energy storage into AESO processes and procedures, while requiring that the energy storage is designed to minimum standards;
- (f) Ensure that the cost of transmission system losses can be recovered from energy storage resources;
- (g) Facilitate red-tape reduction by streamlining, shortening and simplifying ISO rules, and by removing underutilized terminology; and
- (h) Offer low-cost implementation.

3.1.4 Conclusion

17. The Commission is satisfied that the proposed energy storage amendments meet all requirements for approval as set out in Section 20.21(2) of the *Electric Utilities Act*.

18. More specifically, noting the absence of opposition to the application, and in the absence of evidence to the contrary, the Commission is satisfied, based on the AESO's explanations and the Commission's technical review, that the proposed energy storage amendments are not technically deficient, support the fair, efficient and openly competitive operation of the market to which they relate and are in the public interest.

3.2 Did the AESO fulfill its obligation to adequately consult with stakeholders

19. Sections 4 and 5 of Rule 017 require the AESO to post notice of proposed rules, receive comments from stakeholders and provide written responses to stakeholder comments, all of which must be posted on its website. Beginning in February 2021, the AESO, in several rounds, issued letter of notice to stakeholders, held stakeholder sessions, received comments from stakeholders and made revisions to the proposed energy storage amendments where appropriate. All comments, along with AESO replies explaining the rationale for why certain positions were accepted or rejected, were then posted to the AESO's website.

20. The AESO submitted that its consultation process included any party that was interested in, or may be directly affected by, the proposed energy storage amendments.

21. The full details of the consultation process are available on the record of this proceeding (over 3000 pages total). 145 stakeholders participated in the consultation process, and the AESO is of the position that, other than some requests for future consultation on topics beyond the scope of the current application, there are no outstanding issues among stakeholders for the proposed energy storage amendments.

4 Order

22. The Commission finds that, in proposing the energy storage amendments, the AESO has complied with Section 20.21 of the *Electric Utilities Act* and Rule 017.

23. Accordingly, pursuant to Section 20.21(1)(a) of the *Electric Utilities Act*, the Commission, by order, approves the proposed energy storage amendments to the ISO rules and definitions contained in Appendix A, to be effective April 1, 2024.

Dated on June 13, 2023.

Alberta Utilities Commission

(original signed by)

Vincent Kostas
Acting Commission Member

Appendix A – List of Energy Storage Amendments to ISO Rules and Definitions

ISO rules	Action ⁵
Section 103.4 Power Pool Financial Settlement	Amended
Section 103.14 Waivers and Variances	Amended
Section 201.7 Dispatches	Amended
Section 202.2 Short-Term Adequacy and Supply Shortfall	Amended
Section 202.3 Issuing Dispatches for Equal Prices	Amended
Section 202.5 Supply Surplus	Amended
Section 202.6 Adequacy of Supply	Amended
Section 203.1 Offers and Bids for Energy	Amended
Section 203.3 Energy Restatements	Amended
Section 203.4 Delivery Requirements for Energy	Amended
Section 203.5 Consumption Requirements for Bids	New
Section 205.4 Regulating Reserve Technical Requirements and Performance Standards	Amended
Section 205.5 Spinning Reserve Technical Requirements and Performance Standards	Amended
Section 205.6 Supplemental Reserve Technical Requirements and Performance Standards	Amended
Section 205.8 Transmission Must-Run	Amended
Section 301.2 ISO Directives	Amended
Section 304.3 Wind and Solar Power Ramp Up Management	Amended
Section 304.4 Maintaining Network Voltage	Amended
Section 304.7 Event Reporting	Amended
Section 304.8 Event Analysis	Amended
Section 304.9 Wind and Solar Aggregated Facility Forecasting	Amended
Section 306.4 Transmission Planned Outage Reporting and Coordination	Amended
Section 306.5 Source Asset Outage Reporting and Coordination	Amended
Section 306.7 Mothball Outage Reporting	Amended
Section 501.10 Transmission Loss Factors	Amended
Division 502 <i>Technical Requirements</i> has been restructured into Division 503 <i>Technical and Operating Requirements</i>	
Section 503.1 Functional Specification and Legacy Treatment	Restructured – New
Section 503.2 Maximum Authorized Real Power and Maximum Authorized Charging Power	Restructured – New
Section 503.3 Reactive Power	Restructured – New
Section 503.4 Voltage Regulation	Restructured – New
Section 503.5 Voltage Ride-Through	Restructured – New
Section 503.6 Frequency and Speed Governing	Restructured – New
Section 503.7 Power System Stabilizer	Restructured – New

⁵ **Division 502** *Technical Requirements* has been restructured into **Division 503** *Technical and Operating Requirements* (most sections from 502.1 to 502.16, inclusive, have been restructured and renumbered into sections 503.1 to 503.22, and no longer exist with their original numbering).

Section 503.8	<i>Transmission Step-Up Transformer</i>	Restructured – New
Section 503.9	<i>Auxiliary Systems</i>	Restructured – New
Section 503.10	<i>Isolating and Interrupting Devices</i>	Restructured – New
Section 503.11	<i>Power Quality</i>	Restructured – New
Section 503.12	<i>Grounding and Surge Protection</i>	Restructured – New
Section 503.13	<i>Synchrophasor Measurement System</i>	Restructured – Amended
Section 503.14	<i>Sequence of Events Monitoring</i>	Restructured – New
Section 503.15	<i>Interconnected Electric System Protection</i>	Restructured – Amended
Section 503.16	<i>SCADA</i>	Restructured – Amended
Section 503.17	<i>Revenue Metering System</i>	Restructured – Amended
Section 503.18	<i>Operation and Maintenance of Facilities</i>	Restructured – New
Section 503.19	<i>Reactive Power Verification Testing</i>	Restructured – New
Section 503.20	<i>Baseline and Model Validation Testing</i>	Restructured – New
Section 503.21	<i>Reporting Facility Modelling Data</i>	Restructured – Amended
Section 503.22	<i>Bulk Transmission Line Technical Requirements</i>	Restructured – Amended
Section 504.3	<i>Coordinating Energization, Commissioning, and Ancillary Services Testing</i>	Amended
Section 504.4	<i>Coordinating Operational Testing</i>	Amended
Section 505.2	<i>Performance Assessment for Refund of Generating Unit Owner’s Contribution</i>	Amended
Section 505.3	<i>Coordinating Synchronization, Commissioning, Model and Reactive Power Validation Testing and Ancillary Services Testing</i>	Amended
Section 505.4	<i>Coordinating Operational Testing</i>	Amended
ISO rules Energy Storage Definitions		Action
“acceptable operational reason”		Amended
“aggregated facility”		Amended
“Alberta internal load”		Amended
“allowable dispatch variance”		Amended
“automatic generation control (AGC)”		Amended
“automatic voltage regulator (AVR)”		Amended
“available capability”		Amended
“black start capability (BSC)”		Retired
“bulk transmission line”		Amended
“collector bus”		Amended
“commercial operation”		Amended
“commissioning”		Amended
“control centre”		Amended
“electric distribution system”		Amended
“electrical islands”		Amended
“energy storage facility”		Retired
“energy storage resource”		New
“generating asset steady state”		Amended

"generating unit"	Amended
"governor or governor system"	Amended
"gross real power"	Amended
"in merit"	Amended
"incremental generation costs"	Amended
"legal owner"	Amended
"long lead time asset"	Amended
"loss factor"	Amended
"market participant"	Amended
"maximum authorized charging power"	Amended
"maximum authorized discharging power"	Retired
"maximum authorized real power"	Amended
"maximum capability"	Amended
"non-controllable"	New
"operational deviation"	Amended
"operator"	Amended
"partially-controllable"	New
"point of connection"	Amended
"point of supply"	Amended
"pool asset"	Amended
"ramping"	Retired
"scheduled generator outage"	Retired
"sink asset"	Amended
"source asset"	Amended
"transmission facility"	Amended
"transmission must-run"	Amended
"variable energy resource quantity"	New