

# **Energy Storage ISO Rule Amendments Stakeholder Session 3**

February 2, 2023

The AESO is hosting this session from Calgary, which is located in the Treaty 7 region comprised of the traditional territories of the Tsuut'ina First Nation, the Blackfoot Confederacy which includes the Kainai, Piikani and Siksika First Nations, the Stoney Nakoda Nations, and is also home to the Métis Nation of Alberta, Region 3.

We are grateful to have the opportunity to work and be present in this territory together with many Indigenous peoples from across Turtle Island.

The AESO is consulting with Stakeholders on the development of the proposed Energy Storage ISO Rule Amendments that will:

- facilitate the integration of energy storage;
- improve the clarity required for market qualification and participation; and
- enable efficient, effective connection, monitoring, and control of energy storage when connected.

	Consultation Step
May - June 2022	ES ISO Rule Amendments (version 1.0) & initial Stakeholder feedback
September 2022	<p>Session 1:</p> <ul style="list-style-type: none"><li>• Transition from “aggregated generating facility” to “aggregated facility”</li><li>• Power measurement terms</li><li>• Allowable dispatch variance &amp; VER-block</li></ul> <p>Session 2:</p> <ul style="list-style-type: none"><li>• Open Q&amp;A</li></ul>
November 2022	<p>ES ISO Rule Amendments (version 2.0)</p> <ul style="list-style-type: none"><li>• Restructuring of Technical ISO Rules from Division 502 to Division 503</li></ul>
December 2022	Stakeholder comments on version 2.0
February 2023	Session 3

- Requests for another session:
  - Restructuring of Division 502 to Division 503 & scope impacts
  - Impacts of Section 503.1, *Functional Specification and Legacy Treatment*
- Specific technical questions on Division 503 requirements
- “Fixes” bucket
  - Drafting suggestions
  - Administrative / blackline corrections

1. Discuss comments on the structural transition from Division 502 to Division 503
2. Discuss comments on proposed new Section 503.1, *Functional Specification and Legacy Treatment*
3. Respond to specific technical questions raised by Stakeholders regarding the proposed new Division 503-series rules
4. Open Q&A (time-permitting)
5. Confirm final engagement steps

# Session 3 Agenda

Topic	Facilitator
Welcome / Introduction / Housekeeping	Jackie Gow
Restructuring of Division 502 to Division 503 <ul style="list-style-type: none"><li>• Why the restructuring?</li><li>• Scope of changes</li></ul> Section 503.1, <i>Functional Specification &amp; Legacy Treatment</i> <ul style="list-style-type: none"><li>• Intent &amp; principles</li><li>• Effective date markers for legacy treatment</li></ul> <i>Questions/Group Discussion</i>	Steve Waller Jackie Gow
<b>Break</b>	
Specific Technical Questions <ul style="list-style-type: none"><li>• Operational Reserves</li><li>• MARP/MACP</li><li>• Voltage, Frequency and Power System Stabilizer</li><li>• Operation, Maintenance and Auxiliary Systems</li><li>• Other Specific Questions</li></ul> <i>Questions/Group Discussion</i>	Brad Coleman
Open Q&A	Jackie Gow Brad Coleman Steve Waller
Next steps	Jackie Gow

- Brad Coleman, Senior Engineering Analyst, Generation & Transmission
- Steve Waller, Senior Market Advisor, Market Implementation
- Jackie Gow, Legal Manager, ISO Rules and Alberta Reliability Standards, Legal & Regulatory Affairs
- Ruppa Louissaint, Manager, Market Implementation
- Allison Zwozdesky, Learning & Development Analyst
- Melissa Mitchell-Moisson, Regulatory Analyst, Legal & Regulatory Affairs
- Josef Kruger, Senior Regulatory Analyst, Legal & Regulatory Affairs
- Valerie Anasco, Legal & Regulatory Coordinator



# Session 3 Attendees (Jan 31, 2023)

- Arcadis-IBI Group
- ABO Wind
- ABO Wind Canada
- Acestes Power
- Aecon Concessions
- AESO
- Alberta Innovates
- AltaLink
- Arcadis IBI Group
- ASCENT Energy Partners Ltd.
- ATCO
- ATCO Electric
- BBA Consultants
- BluEarth Renewables
- BowMont Capital
- Canadian Solar
- CanREA
- Capital Power
- Carlotta Energy
- Certrec
- Chapman Ventures Inc.
- City of Medicine Hat
- Competition Bureau
- Customized Energy Solutions
- DePal Consulting Limited
- EDF Renewables
- Enbridge Inc.
- Enel North America
- Enerfin
- Energy Storage Canada
- ENMAX
- ENMAX Corporation
- ENMAX Power Corporation
- EPCOR
- EPCOR Distribution & Transmission Inc.
- EPCOR Transmission
- Evolugen
- Executive Fellow School of Public Policy
- University of Calgary
- Federation Engineering
- Firefly Power and Energy
- Government
- GridBeyond
- Heartland Generation Ltd.
- hep energy Canada Ltd.
- Independent Consultant
- Kestrel Power
- KPMG Canada
- Mirastar Energy
- Neoen Renewables Canada Inc.
- NRG Curtailment Solutions
- NU-E Corp
- PACE Canada LP
- Pembina Pipeline Corp
- Perimeter Solar Inc.
- PGSC
- Plains Midstream Canada
- Potentia Renewables
- Prairie Sky Strategy
- Recurrent Energy
- Suncor Energy Marketing Inc.
- SWITCH Power
- TC Energy Corporation
- The Brattle Group
- TransAlta Corporation
- University of Calgary
- Westbridge Energy
- Yes Energy LLC

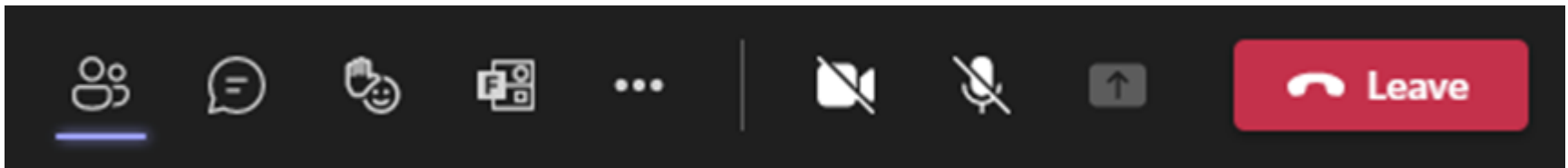
In accordance with its mandate to operate in the public interest, the AESO will be audio recording this session. The accessibility of these discussions is important to ensure the openness and transparency of this AESO process, and to facilitate the participation of stakeholders. Participation in this session is completely voluntary and subject to the terms of this notice.

The collection of personal information by the AESO for this session will be used for the purpose of capturing stakeholder input. This information is collected in accordance with Section 33(c) of the Freedom of Information and Protection of Privacy Act. If you have any questions or concerns regarding how your information will be handled, please contact the Director, Information and Governance Services at 2500, 330 – 5th Avenue S.W., Calgary, Alberta, T2P 0L4, by telephone at 403-539-2528, or by email at [privacy@aeso.ca](mailto:privacy@aeso.ca).

- Meeting minutes will be prepared by AESO employees with the help of a minute-taking software program.
- Organization names will be used to identify contributions.
- Draft meeting minutes will be circulated to attendees for review and ultimately posted to the AESO website.

- Washrooms are located directly across the hall from this conference room.
- Coffee & Snacks can be found outside the doors on the right side of the room
- **Fire Exits.** In the event of a fire, we will exit the Conference Centre through the main glass doors, exit the building using the South Exits and cross the street to go to the muster point which is the *Plaza on south side of 5th Avenue Place*. Instructions will be provided over the public announcements system.

- Participation is encouraged 😊
- In-Person Attendees
  - Please flip your name tent vertical if you have a question or comment & we will call on you.
  - Ceiling microphones will pick up audio (will be muted on breaks)
- Online Attendees
  - For verbal questions/comments, please raise your virtual hand. We will call on you to unmute your mic
  - For written comments, use the Q&A function.



- If you are having tech issues, please email [rules\\_comments@aeso.ca](mailto:rules_comments@aeso.ca) for assistance.

The background of the slide is a blue-tinted image. It shows a close-up of two hands shaking in a firm grip, symbolizing agreement or partnership. In the background, a city skyline is visible, with various buildings and structures. Overlaid on the image is a network of thin white lines connecting various points, suggesting a global or interconnected network.

## *OUR ENGAGEMENT PRINCIPLES*

**Inclusive and Accessible**

**Strategic and Coordinated**

**Transparent and Timely**

**Customized and Meaningful**

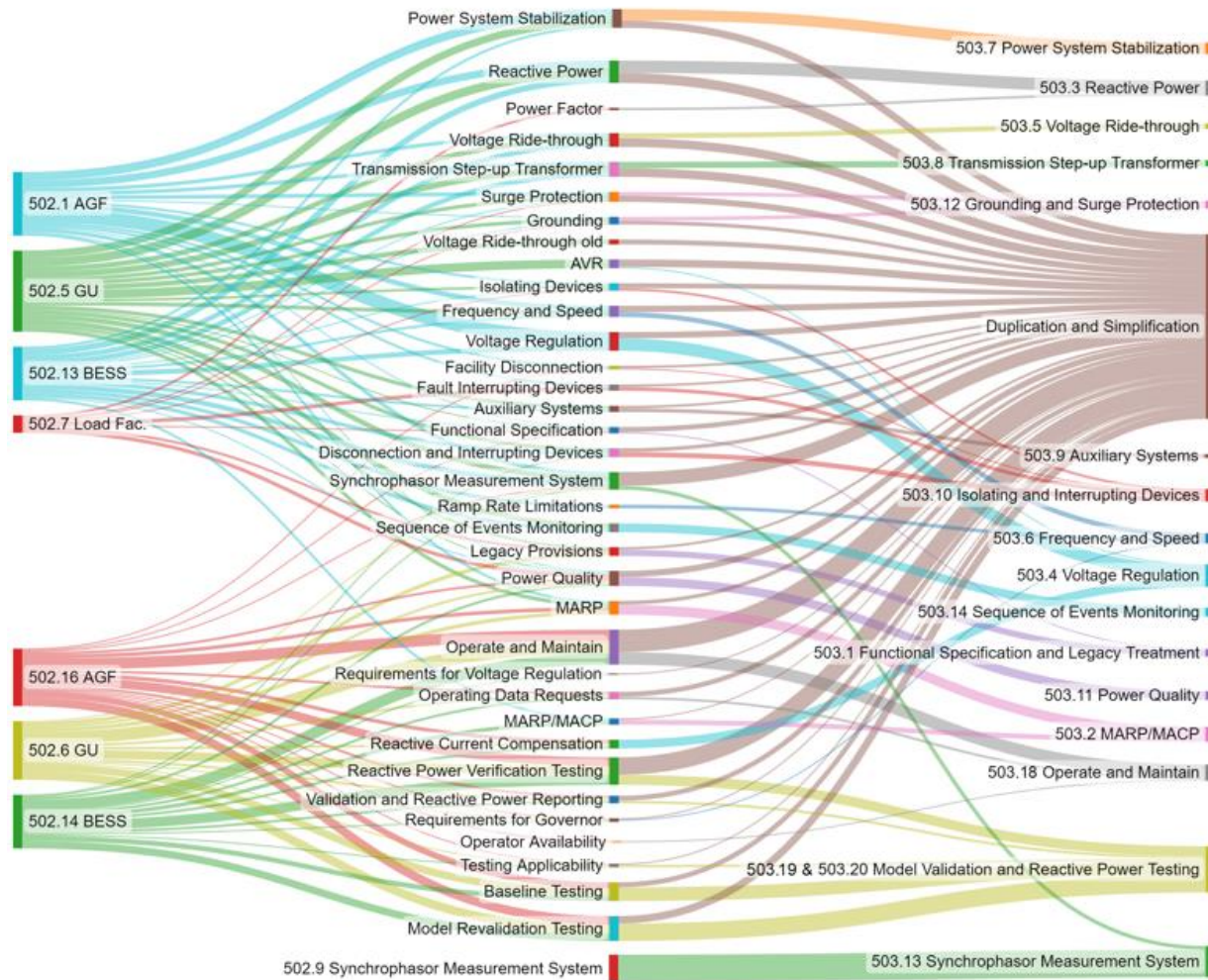




# Technical Rules for Energy Storage

## Restructuring of Division 502 to Division 503

# Transition from Division 502 to 503



*On second thought...*



# Transition from Division 502 to 503

Existing Division 502	Proposed Division 503
<b>"Technology-based" ISO Rules</b> <i>Rule only applies to a single technology</i>	<b>"Requirement-based" ISO Rules</b> <i>Rule applies to all technologies</i>
<ul style="list-style-type: none"> <li>• Generating Unit Technical Requirements (502.5)</li> <li>• Generating Unit Operating Requirements (502.6)</li> <li>• Aggregated Generating Unit Technical Requirements (502.1)</li> <li>• Aggregated Generating Unit Operating Requirements (502.16)</li> <li>• Battery Energy Storage Facility Technical Requirements (502.13)</li> <li>• Battery Energy Storage Facility Operating Requirements (502.14)</li> <li>• Load Facility Technical Requirements (502.7)</li> </ul>	<ul style="list-style-type: none"> <li>• Functional Specification and Legacy Treatment (503.1)</li> <li>• Maximum Authorized Real Power and Maximum Authorized Charging Power (503.2)</li> <li>• Reactive Power (503.3)</li> <li>• Voltage Regulation (503.4)</li> <li>• Voltage Ride-Through (503.5)</li> <li>• Frequency and Speed Governing (503.6)</li> <li>• Power System Stabilizer (503.7)</li> <li>• Step-Up Transformer (503.8)</li> <li>• Auxiliary Systems (503.9)</li> <li>• Isolating and Interrupting Devices (503.10)</li> <li>• Power Quality (503.11)</li> <li>• Grounding and Surge Protection (503.12)</li> <li>• Synchrophasor Measurement System (503.13)</li> <li>• Sequence of Events Monitoring (503.14)</li> <li>• Interconnected Electric System Protection (503.15)</li> <li>• SCADA (503.16)</li> <li>• Revenue Metering System (503.17)</li> <li>• Operation and Maintenance of Facilities (503.18)</li> <li>• Reactive Power Verification Testing (503.19)</li> <li>• Baseline and Model Validation Testing (503.20)</li> <li>• Reporting Facility Modelling Data (503.21)</li> <li>• Bulk Transmission Line Technical Requirements (503.22)</li> </ul>
<b>"Requirement-based" ISO Rules</b> <i>Rule applies to all technologies</i>	
<ul style="list-style-type: none"> <li>• Bulk Transmission Line Technical Requirements (502.2)</li> <li>• Interconnected Electric System Protection Requirements (502.3)</li> <li>• Automated Dispatch &amp; Messaging System Requirements (502.4)<sup>1</sup></li> <li>• SCADA Technical &amp; Operating Requirements (502.8)</li> <li>• Synchrophasor Measurement Unit Technical Requirements (502.9)</li> <li>• Revenue Metering System Technical &amp; Operating Requirements (502.10)</li> <li>• Reporting Facility Modelling Data (502.15)</li> </ul>	

# Why did we go through all this trouble?

- In the beginning, we only had generating units and wrote ISO rules specifically for those (primarily thermal).
- Wind came along and we wrote ISO rules specifically for wind (wind AGF).
- Next came solar and we integrated solar into the ISO rules in a technology specific manner as well (solar AGF).
- Now, with the integration of ES, we have synchronous, batteries and hybrid configurations to account for.
  - Writing technology-specific rules for all the permutations and combinations of energy storage became complex and convoluted in the rule structure we had.
- Solution was to restructure existing Division 502 based on subject matter of requirements rather than the technology.

- Synchronous “standalone” energy storage
  - Pumped hydro
  - Flywheel
  - CAES
- Battery energy storage
  - Aggregation of battery cells
- Hybrids
  - Battery + wind/solar
  - Synchronous storage + wind/solar
  - Battery or synchronous storage + thermal GU



- ISO rules are drafted at a high level, but where requirements needed to be qualified to apply to specific technologies they are qualified

- “aggregated facility containing wind or solar”, *e.g.*

**3(1)** The **legal owner** of an **aggregated facility** containing wind or solar 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**.

- “aggregated facility containing energy storage resource”, *e.g.*

**3(1)** The **legal owner** of an **energy storage resource** or **aggregated facility** containing an **energy storage resource** must, upon receiving a request from the **ISO**, determine the **maximum authorized charging power** for the **energy storage resource** or **aggregated facility** and provide this value to the **ISO**.

- Removed duplication across technology-specific rules
- Better understanding of how technical & operating requirements differ based on technology
- Ease of reference
- Shorter ISO rules
- Streamlining and efficiency for future amendments
- Standardizing methodology for legacy requirement

- Restructuring unearthed some issues with existing requirements applicable to technologies other than energy storage
- AESO approach to scope (same as the outset):
  - Integrated new requirements for energy storage
  - Amended existing requirements for energy storage to the extent necessary
  - Addressed administrative amendments (per AUC Rule 017 definition) in ISO rules with substantive changes for energy storage



# Technical Rules for Energy Storage

Section 503.1, *Functional Specification  
& Legacy Treatment* (“Legacy Rule”)

- Natural consequence of restructuring from Division 502 to Division 503
- No intention to disrupt status quo in how legacy treatment works today
- Principles:
  - Comply with the requirements you were designed and built to (or upgraded to), unless the ISO rule is specifically drafted to require compliance from everyone (s. 3)
  - If you are changing something, bring whatever you touch “up to code” (not the whole facility) (s. 4)
  - If necessary for safety or reliability, the AESO can require compliance with an updated requirement (s. 5)

- Request to add that functional specification can contain variances ISO approves
  - Agree

### Functional Specification

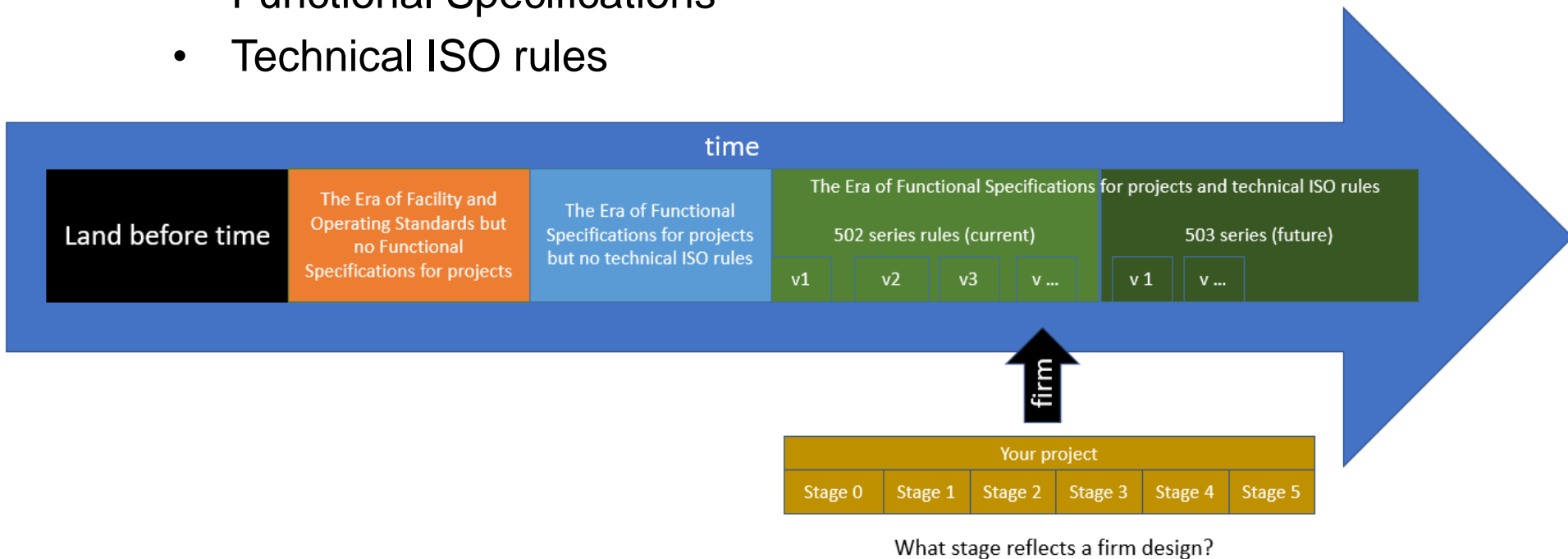
**2** The **ISO** must, in accordance and generally consistent with Division 503 of the **ISO rules**, approve a functional specification containing details, work requirements, and specifications for the design, construction, and operation of a project and any associated **transmission system** connection facilities.

- Intent: comply with the requirements you were built / upgraded to
  - Division 502 typically referenced “functional specification” as date marker, but not all facilities have a functional specification.
  - Date marker amended to “facility application approval” but may not be the logical date marker for all.

### Legacy Treatment

**3** A **legal owner** must, unless otherwise specifically stated in an **ISO rule** within Division 503 of the **ISO rules**, remain compliant with the applicable predecessor document to an **ISO rule** within Division 503 if the **legal owner's** facility received facility application approval prior to the effective date of an **ISO rule** within Division 503.

- Rules & Standards Timescale
  - Pre-AESO era
  - AESO-era: Incremental developments over time, including
    - Facility and Operating Standards
    - Functional Specifications
    - Technical ISO rules



### Group Discussion Question

- What is an effective time or event to describe the “point of no return?” (aka when facility design is locked in)
- Options:
  - Date of issuance of functional specification?
    - Multiple versions issued – which one?
  - AUC facility application approval?
  - AUC interconnection approval?
  - “Original date of the commencement of the design” (appears in existing Section 502.2)
  - Others?
- Goal: draft high level for flexibility, but provide sufficient certainty.

- Intent: if you are changing something, bring whatever you touch “up to code” (not the whole facility)
  - Understand this inadvertently expands the scope of bulk t-line rule legacy from existing Section 502.2 & will propose some amendments.

## Modifications to Facilities

**4(1)** A **legal owner** must, notwithstanding subsection 3 and subject to subsection 4(2), comply with the applicable requirements of Division 503 of the **ISO rules** if the **legal owner's** facility or resource, or any supporting systems, undergoes an addition, replacement, or upgrade.

**(2)** A **legal owner** of an existing **bulk transmission line** that is extending, tapping, or adding to the **bulk transmission line**:

- (a) must, if the project circuit length will be greater than or equal to 1,500 meters, comply with the applicable requirements of Division 503 of the **ISO rules**; or
- (b) must, if the project circuit length will be less than 1,500 meters, comply with the:
  - (i) applicable technical specification and design requirements for the **bulk transmission line** in effect as of the original date of the commencement of the design of the bulk transmission line; and
  - (ii) specifications set out in the most recently published edition of the *Alberta Electrical Utility Code*.

- No issues?

## Authority to Require Compliance

**5** The **ISO** may, notwithstanding subsection 3, require a **legal owner** to comply with any provision of Division 503 if the **ISO** determines that such compliance is necessary for the safe and reliable operation of the **interconnected electric system**.





# Technical Rules for Energy Storage

## Specific Technical Questions

- Sections 205.4, 205.5, and 205.6, Operational Reserves
- Section 503.2, MARP and MACP
- Section 503.5, Voltage Ride Through
- Section 503.6, Frequency and Speed Governing
- Section 503.7, Power System Stabilizer
- Section 503.9, Auxiliary Systems
- Section 503.18, Operation and Maintenance of Facilities
- Other Specific Technical Questions

- Comments and Questions from Stakeholders
  - Some rules make references to “stator winding terminals”
    - At times, ambiguous about application of this terminology to technology
  - Clarify changes in Appendix 1
- As much as possible, we tried to make the rules technology agnostic; however, there are places where the technology still needs to be referenced

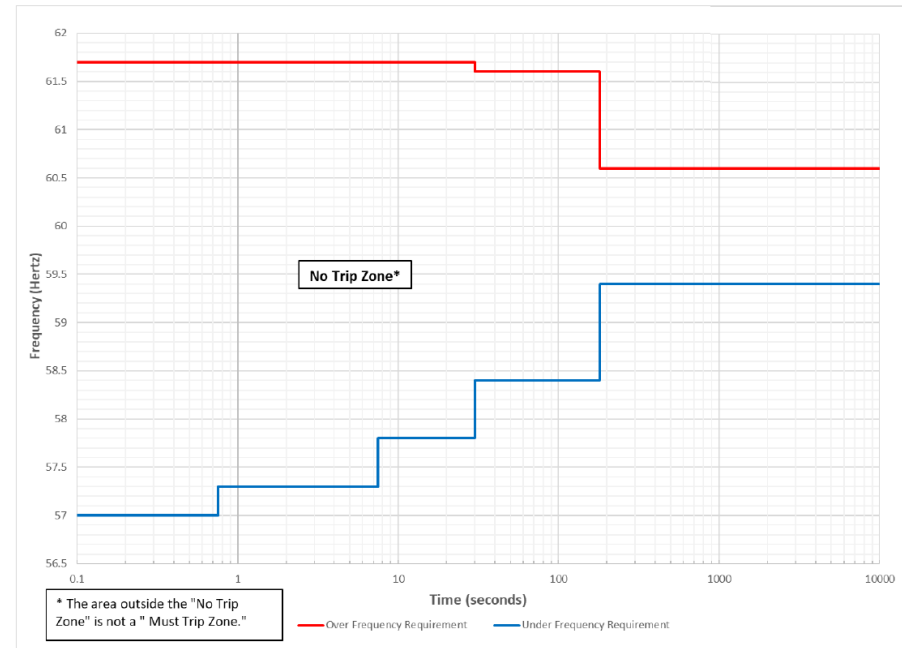
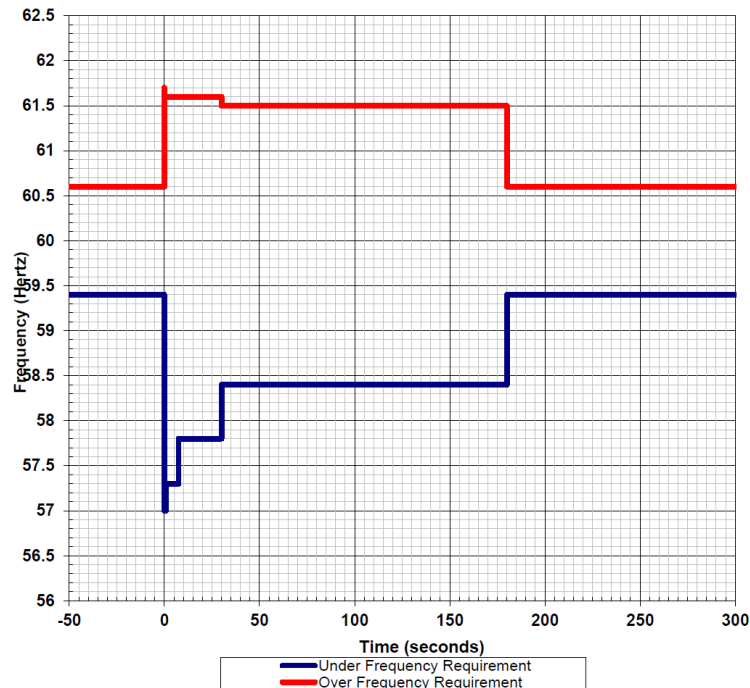
## Measuring Frequency Response when under Dispatch to Provide Regulating Reserve

- 8 For the purpose of subsection 6, frequency response performance is measured at:
- (a) the stator winding terminals of a **generating unit; or energy storage resource;**
  - (b) the circuit breaker or disconnection device that is electrically closest to each load;
  - (c) the alternating current terminal closest to each inverter based technology;

Add ‘synchronous’ before energy storage resource in this instance (from Section 205.4)

# Frequency Ride Through – Sections 205.4, 205.5, and 503.6

- Frequency graph in Sections 205.4, 205.5, and new Section 503.6
  - Administrative correction to graph
  - Tabulated values are unchanged and correct
  - Graph updated to align with NERC PRC-024



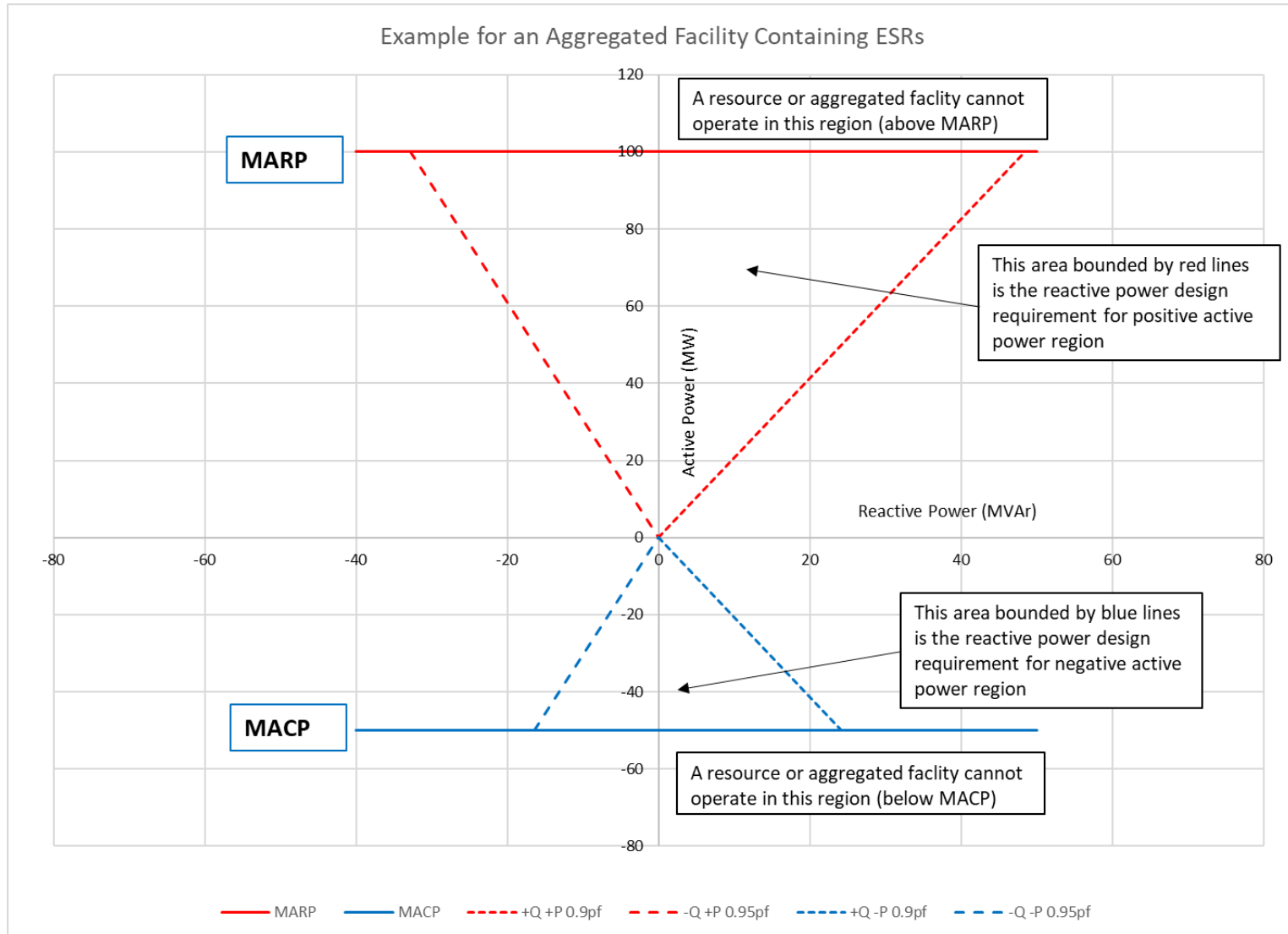
- Comments and questions from Stakeholders
  - Clarify the requirement to exclude auxiliary power from MARP and MACP
  - Clarify the operation 'below MACP' and the singing convention to be employed

- For purposes of applying MARP and MACP to the rules, the intent is that both are taken as signed quantities
- Instances where 'between MARP and MACP' would be interpreted as  $(\text{MARP} - \text{MACP})$ , where MACP is negative
  - *i.e.*, same as  $\text{MARP} + |\text{MACP}|$
- Auxiliary power should not be included in determining MARP and MACP
  - MARP and MACP are based on the resource attributes only

### Operation at Maximum Authorized Charging Power

**5** The operator of an energy storage resource or aggregated facility containing an energy storage resource must not operate the energy storage resource or aggregated facility below the maximum authorized charging power.

# Section 503.2, MARP and MACP

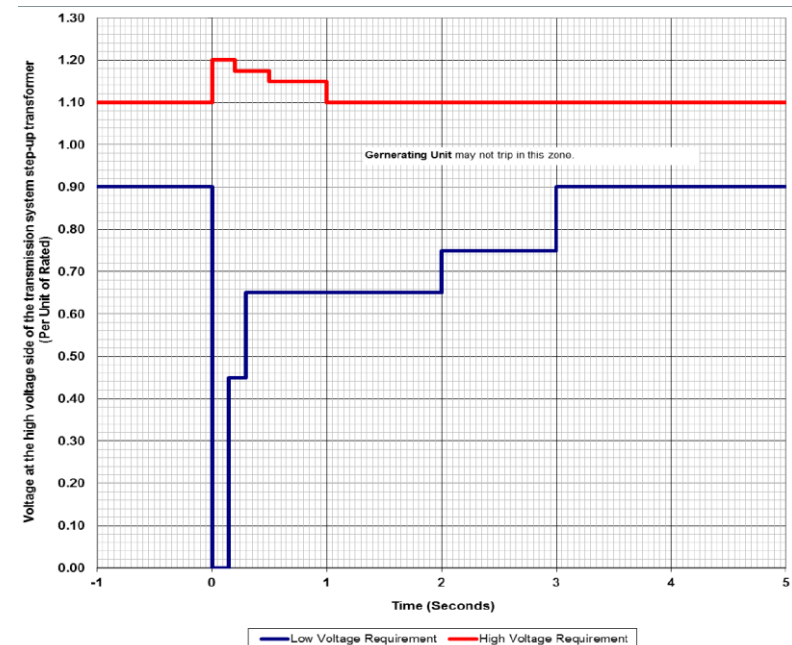




- Comments and Questions from Stakeholders
  - Section 503.5 does not adequately deal with the legacy treatment and ‘existing generating units’; how will this be addressed?
  - What entity determines normal clearing time?

# Section 503.5, Voltage Ride-Through

- ‘Existing’ generator needs to meet the requirements for voltage ride through in place at the time of their approval.
- Normal clearing time to be determined by legal owners of the facilities within applicable rule and standards
- Suggest edits to align this graph to the frequency ride through requirements



**normal clearing** means that a **protection system** operates as designed and the fault is cleared in the time normally expected with proper functioning **protection systems**.

- Comments and Questions from Stakeholders
  - Recommend removing references to ‘synchronous machine’
  - The droop setting should be based on active power output rather than MARP
  - Clarify the droop response between MARP and MACP
  - Does an ESR need to be frequency responsive while consuming active power?

# Section 503.6, Frequency and Speed Governing

## Frequency and Speed Governing Requirements for Generating Units

**2(1)** The **legal owner** of a **generating unit** with **maximum authorized real power** equal to or greater than 10 MW must ensure that the **generating unit** has a continuously acting **governor system** that is designed:

- (a) to be continuously in service, free to respond to frequency changes and controlling the response to frequency changes while the **generating unit** is:
  - (i) electrically connected to the **transmission system**; and
  - (ii) is producing any **real power** as measured at the **synchronous machine stator winding terminals**;
- (b) with a droop setting equal to or greater than 3% but less than or equal to 5% based on **maximum authorized real power**;
- (c) with a deadband, intentional plus unintentional, not exceeding plus or minus 0.036 Hz; and
- (d) with the capability of manual setpoint adjustments within a range of 59.4 Hz and 60.6 Hz.

Synchronous machine references will be removed where appropriate and where it does not add confusion.

## Frequency and Speed Governing Requirements for Aggregated Facilities and Energy Storage Resources

**3(1)** The **legal owner** of an **aggregated facility** or **energy storage resource** must ensure the **aggregated facility** or **energy storage resource** has a continuously acting **governor system** that is designed:

- (a) to be continuously in service, free to respond to frequency changes and controlling the response to frequency changes while the **aggregated facility** or **energy storage resource** is:
  - (i) connected to the **transmission system** or a **transmission facility** within the service area of the City of Medicine Hat; and
  - (ii) is producing or consuming any **real power** as measured at the **collector bus**;
- (b) with a droop setting equal to or greater than 3% but less than or equal to 5%, where droop setting is based on:
  - (i) **maximum authorized real power**, for an **aggregated facility** that does not contain an **energy storage resource**; or

- The conventional definition of droop is the amount of speed change that is necessary to cause the prime mover mechanism to move through 100% of its range
- Basing droop on current active power output would degrade the effective frequency response of resources at low levels of production

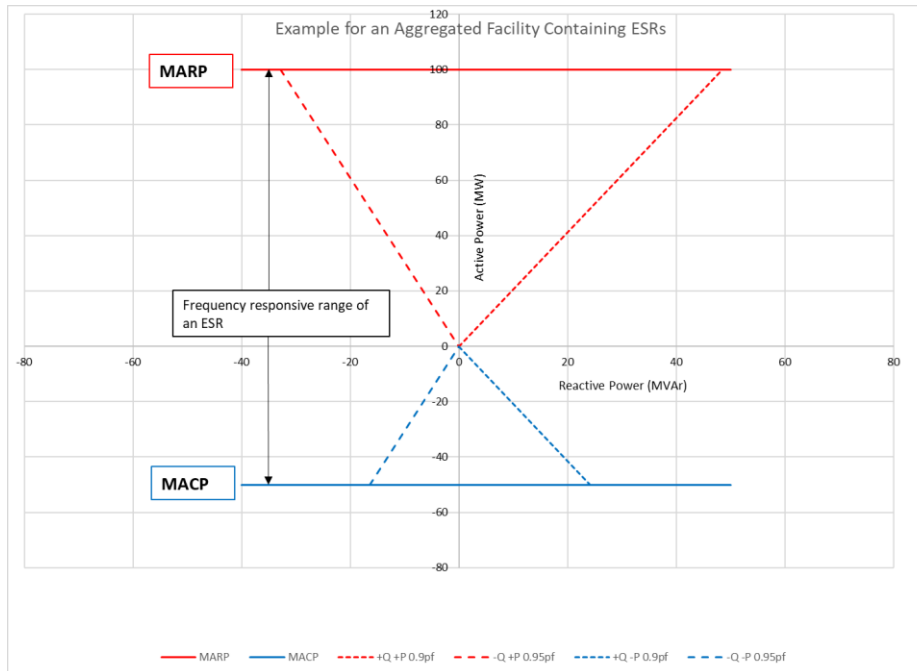
Estimated effective droop response  
for a MARP=100MW Generating  
Unit for 0.5Hz frequency dip at 5%  
droop:

$$\begin{aligned}\Delta P &= (\Delta f/60)*(1/R)*MARP \\ \Delta P &= (0.5/60)*(1/.05)*100 \\ \Delta P &= 16.67 \text{ MW}\end{aligned}$$

Estimated effective droop response  
for a MACP=-10MW,  
MARP=100MW Battery System for  
0.5Hz frequency dip at 5% droop:

$$\begin{aligned}\Delta P &= (\Delta f/60)*(1/R)*MARP-MACP \\ \Delta P &= (0.5/60)*(1/.05)*100-(-10) \\ \Delta P &= 18.33 \text{ MW}\end{aligned}$$

- ESRs are a unique resource that have unique properties, this technology is intended to enhance frequency response in both power producing and consuming modes
- The AESO believes that the frequency responsive nature of ESRs over the full spectrum is important to the reliability of the grid



- Comments and Questions from Stakeholders
  - Recommend improvements to criteria for power system stabilizers and alignment with VAR-501-WECC-3.1
  - Recommend adding back in the pumped storage reference and requirements
- The AESO generally agrees with the suggested alignment with VAR-501-WECC-3.1 standard
- We would consider this out of scope for this stage of ESR consultation and would be addressed as part of the next stages for ARS updates
- The updated wording in reference to pumped hydro is meant to make this requirement more technology agnostic

- Comments and Questions from Stakeholders
  - What if the loss of a combustion turbine followed by the tripping of a steam turbine affects MSSC?
  - Can we add a requirements for combined cycle plants to design for longer run times of gas turbine after a steam turbine trip?



- CTG\* trip will cause a STG trip by very nature of combined cycle plants, s. 2(1)(c) acknowledges this
- STG\* trip can cause a CTG trip on combined cycle plants, we would expect this to be staggered as per s. 2(1)(b)

### Auxiliary Systems

2(1) The **legal owner** must, when multiple **generating units** or **energy storage resources** are at a common location, design the auxiliary systems of each **generating unit** or **energy storage resource** such that:

- (a) the failure of a single component will not result in the simultaneous tripping or shutdown of 2 or more **generating units** or **energy storage resources**;
- (b) staggered shutdowns of each **generating unit** or **energy storage resource** must be separated in time by more than 10 minutes; and
- (c) for combined cycle plants, the loss of the combustion turbine that results in the tripping of the steam turbine is acceptable.

(2) The **legal owner** must design the auxiliary systems of each **generating unit** or **energy storage resource** to take into account the voltage ride-through requirements as specified in Section 503.5 of the **ISO rules**, *Voltage Ride-Through*, as applicable.

\***STG**: steam turbine generator

\***CTG**: combustion turbine generator

- Comments and Questions from Stakeholders
  - The exemption for excitation systems, voltage regulating systems, and power system stabilizers (under VAR-002-AB-4.1) has been removed from Section 503.18
- The exemption was in place as there was overlap with VAR-002-AB-4.1
- Existing generators will only need to comply with the applicable previous Division 502 rules at the time of their approval
- VAR-002-AB-4.1 did not include ESRs; therefore, this exemption was removed for the new rule; however, some overlap remains
- The overlap will be remedied as part of the ARS initiative in the following stages of ESR implementation

- Comments and Question from Stakeholders
  - Clarify why the requirement to report decreases in MARP and MACP been added to Section 503.19
  - Clarify why WECC has been removed; *i.e.*, is this no longer a requirement for Section 505.3?
- This requirement to report a decrease in MARP and MACP is unnecessary and will be removed
- The removal of references to “WECC testing” were removed to provide better clarity and to better describe testing
  - This is a name change only, the requirements remain the same

- Comments and Questions from Stakeholders
  - Strengthening wording from being ‘able to operate within an effectively grounded system’ to ‘effectively grounded’ in Section 503.12, *Grounding and Surge protection*
- Generally, the AESO agrees with suggestions. However, this was not considered in the original scope for the ESR amendments
- This will be considered for a future engagement



## Next Steps

Target Dates	Consultation Step
March 1, 2023	AESO will post: <ul style="list-style-type: none"><li>• Written responses to Stakeholder comments received on Version 2.0 ES ISO Rule Amendments</li><li>• Version 3.0 ES ISO Rule Amendments showing how Stakeholder feedback was incorporated</li></ul>
March 21, 2023	Stakeholder comments on Version 3.0 ES ISO Rule Amendments [*show-stoppers]
End of March 2023	AESO response (if necessary)
Q2 2023	AUC application filed

## *Versions of ES ISO Rule Amendments:*

- Version 1.0 – posted May 9, 2022
- Version 2.0 – posted November 22, 2022
- Version 3.0 – posted March 1, 2023

**OPEN  
Q&A**





**Thank you**