Information Document
Coordinating Synchronization, Commissioning, Baseline and Model Validation Testing, Ancillary Services Testing, or Operational Testing
ID# 2012-012R

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1 Purpose

This information document provides general information relating to the coordination of synchronization, energization, base line and model validation (formerly known as WECC testing) testing activities, ancillary services testing and operational testing activities.

2 Related Documents

Legal owners are encouraged to review the following related documents:

(1) Section 505.3 of the ISO rules, *Coordinating Energization, Commissioning and WECC Testing Activities*. Section 505.3 sets out the requirements for coordinating synchronization, commissioning, WECC testing, and ancillary services testing activities with the AESO. The AESO wishes to point out that section 505.3 does not set out any specific tests that must be performed. Section 505.3 focuses only on the need to coordinate testing activities with the AESO.

(2) Section 505.4 of the ISO rules, *Coordinating Operational Testing Activities*. Section 505.4 sets out the requirements for coordinating operational testing activities with the AESO. The AESO wishes to point out that section 505.4 does not set out any specific test that must be performed. Section 505.4 focuses only on the need to coordinate testing activities with the AESO.

(3) Section 502.16 of the ISO rules, *Aggregated Generating Facilities Operating Requirements* sets out specific model validation testing that wind and solar aggregated generating facilities must perform. The coordination of these tests is subject to the requirements in section 505.3.

(4) Section 502.6 of the ISO rules, *Generating Unit Operating Requirements* sets out the baseline and model validation testing a generating unit must perform. The coordination of those tests is subject to the requirements in section 505.3.

(5) Section 502.14 of the ISO rules, *Battery Energy Storage Facility Operating Requirements* sets out the baseline and model validation testing a battery energy storage facility must perform. As part of good electric industry operating practice, the AESO expects the legal owner to coordinate those tests in the manner set out for generating units and aggregated generating facilities in section 505.3 of the ISO rules, *Coordinating Energization, Commissioning and WECC Testing Activities*.

(6) The AESO also contracts for ancillary services and the technical requirements for ancillary services are set out in the Section 205.4 of the ISO rules, *Regulating Reserve Technical Requirements and Performance Standards*, Section 205.5 of the ISO rules, *Spinning Reserve Technical Requirements and Performance Standards*, and Section 205.6 of the ISO rules, *Supplemental Reserve Technical Requirements and Performance Standards* that are available on the AESO website. A legal owner conducting any testing with respect to those requirements is required to coordinate those tests in accordance with the requirements set out in section 505.3.

(7) AESO Processes:

(a) the AESO's connection process which sets out the process and procedures for connecting facilities to the system;

(b) the AESO's behind-the-fence process which sets out the process and procedures for facilities

that are behind the fence but connected to the system; and

(c) the AESO's system projects process[1]

For purposes of this information document, the 3 processes described above are referred to as "AESO processes".

3 What Kind of Tests Can a Legal Owner Perform?

A legal owner can perform any tests it determines necessary. However, the AESO expects that testing will be coordinated with the AESO so that the AESO can maintain reliable operations of the interconnected electric system while the tests are being performed. Section 6 below provides examples of the types of tests to be coordinated with the AESO.

4 Does the AESO Specify Any Tests?

Yes, the AESO specifies certain tests. The AESO specifies the base line and model validation testing, formerly referred to as WECC testing. In addition, the AESO specifies ancillary services tests demonstrating the capability of providing ancillary services.

Section 502.16 sets out the model validation testing for wind and solar aggregated facilities.

Section 502.6 sets out the baseline and model validation testing for generating units.

Section 502.14 sets out the baseline and model validation testing for battery energy storage facility.

Ancillary services tests are set out in the . Section 205.4 of the ISO rules, *Regulating Reserve Technical Requirements and Performance Standards*, Section 205.5 of the ISO rules, *Spinning Reserve Technical Requirements and Performance Standards*, and Section 205.6 of the ISO rules*, Supplemental Reserve Technical Requirements and Performance Standards*.

5 What Tests are to be (?)Coordinated with the AESO?

When assessing if it's appropriate to coordinate a test with the AESO, consider whether the test:

(a) affects the net-to-grid output (real power or reactive power) of a generating unit or aggregated generating facility;

(b) imposes an operational limitation concerning a generating unit's or aggregated generating facility's net-to-grid output (real power or reactive power) that is not encountered during routine operation (e.g. it is unavailable or derated, or cannot respond to dispatches or directives from the AESO); or

(c) exposes a generating unit or aggregated generating facility to increased risk of tripping compared to routine operation.

If a legal owner is unsure if a test should be coordinated with the AESO, then contact the AESO's Operations Coordination group at gen.testing@aeso.ca. The AESO's goal is to help legal owners complete their testing; the AESO is in the best position to help legal owners complete their tests if it

[1] The AESO grid connection process is available at https://www.aeso.ca/grid/connecting-to-the-grid/connection-process/

knows about those tests.

Following are examples of tests to coordinate with the AESO. These examples are intended to provide guidance. The examples are not intended to provide a complete listing of tests to coordinate with the AESO.

Examples of Types of Testing

(1) A legal owner wishes to perform baseline and model validation testing, including reactive power verification testing

Do you coordinate baseline and model validation testing with the AESO?

Yes, coordinate baseline and model validation testing with the AESO because this type of testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) require transmission system conditions to be pre-configured;

(c) impose restrictions on grid operations; or

(d) affect grid conditions, requiring the AESO's awareness.

(2) A legal owner wishes to perform ancillary services testing to demonstrate its capability of providing ancillary services.

Do you coordinate ancillary services tests with the AESO.

Yes, coordinate ancillary services tests with the AESO because this type of testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) require transmission system conditions to be pre-configured;

(c) impose restrictions on grid operations; or

(d) affect grid conditions, requiring the AESO's awareness.

(3) After a generating unit or aggregating generating facility is synchronized, a legal owner wishes to perform initial commissioning tests such as load rejection tests, testing of automated voltage regulators and power system stabilizer systems, and boiler controls tuning.

Do you coordinate these type of tests with the AESO?

Yes, coordinate these type of tests with the AESO because this type of testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) require transmission system conditions to be pre-configured;

(c) impose restrictions on grid operations; or

(d) affect grid conditions, requiring the AESO's awareness.

(4) A legal owner wishes to perform efficiency testing whereby the output of a generating unit will be held at a specific output level for a period of time.

Do you coordinate this test with the AESO?

Yes, coordinate this type of test with the AESO so that the AESO knows that the output level is

inflexible for a period of time. And the test may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) impose restrictions on grid operations; or

(c) affect grid conditions, requiring the AESO's awareness.

(5) A legal owner wishes to perform a test which will not change the output of the generating unit or facility but during the test, the legal owner will not be able to respond to a dispatch.

Do you coordinate this test with the AESO?

Yes, coordinate this type of test with the AESO for the AESO to be aware of the operational limitations of the generating unit during the test period.

(6) A legal owner wishes to perform operator training activities.

Do you coordinate operator training activities with the AESO?

Yes, coordinate operator training activities with the AESO if those activities impose operating conditions or restrictions not normally encountered in routine operation affecting the net-to-grid real or reactive output. Please note however, the AESO does not anticipate that operator training will normally affect net-to-grid or reactive power output.

(7) A legal owner wishes to perform relative accuracy test audits ("RATA testing").

Do you coordinate RATA testing with the AESO?

Yes, coordinate RATA testing with the AESO because this type of testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) impose restrictions on grid operations; or

(c) affect grid conditions, requiring the AESO's awareness.

(8) A legal owner wishes to perform safety valve testing.

Do you coordinate safety valve testing with the AESO?

Yes, coordinate safety valve testing with the AESO because this type of testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) impose restrictions on grid operations; or

(c) affect grid conditions, requiring the AESO's awareness.

(9) A legal owner wishes to perform tests following planned and unplanned outages.

Do you coordinate these tests with the AESO?

Yes, coordinate these tests with the AESO if those tests will affect the net-to-grid output (real power or reactive power) of a generating unit or aggregating generating gacility, or impose an operational limitation concerning a generating unit's net-to-grid output (real power or reactive power) that is not encountered during routine operation because such testing may:

(a) be impacted by transmission constraints, whether due to planned outages or unplanned real-time conditions;

(b) require transmission system conditions to be pre-configured;

(c) impose restrictions on grid operations; or

(d) affect grid conditions, requiring the AESO's awareness.

The AESO makes all reasonable efforts to assist legal owners to complete operational testing. However, various system conditions, including planned or forced transmission outages, may impact operational testing.

6 Commissioning Plans

The commissioning plan, sometimes referred to as the testing plan, or in the case of operational testing an operational test plan, is the generic term used in this information document, to represent a plan a legal owner prepares setting out its testing activities, whether those testing activities are commissioning, WECC testing, ancillary services testing, or operational testing. The commissioning plan should describe the activities in enough detail that the AESO can assess these tests and possible impacts on system reliability.

7 Submission and Approval of the Commissioning Plan

Section 505.3

Section 505.3 focuses on coordinating energization, commissioning, WECC testing and ancillary services testing. Subsection 3 of section 505.3 sets a deadline of 30 days prior to commissioning or testing for a final, ISO-approved commissioning or testing plan to be in place.

In order to have the approved plan in place 30 days prior to commencing any of the tests, the legal owner needs to submit the plan to the AESO ahead of the 30 days to allow the AESO sufficient time for review and approval. The amount of lead time necessary to review and approve a commissioning plan depends on many factors including:

(1) the number and complexity of the tests the legal owner wishes to perform;

(2) the number of other test plans submitted to the AESO by other legal owners, which also need to be reviewed and approved;

(3) the number of planned and unplanned outages that may be occurring during the same time period for which commissioning plans are submitted for review and approval; and

(4) the number and magnitude of reliability issues that the AESO may be dealing with in the same time period that commissioning plans are submitted for review and approval.

As a general guideline and consistent with AESO processes, the AESO suggests that a legal owner submit a commissioning plan at least 60 days in advance of the testing to allow the AESO time to review and approve the plan 30 days prior to commencing any of the tests. The lead time for the submission of plans will vary based on the volume and nature of the tests and to provide flexibility, a specific lead time is not set out in section 505.3. As such, legal owners are encouraged to work with the assigned AESO project manager to ensure that the commissioning plans are submitted in a timely manner to facilitate having an approved plan in place 30 days prior to commencing any of the tests.

Following is the submission information for commissioning plans relating to section 505.3:

(1) a preliminary commissioning plan for a project administered through the AESO's processes is submitted to the AESO Project Manager leading the project;

(2) a final commissioning plan for a project administered through the AESO's processes is submitted to the AESO's Operations Coordination group at gen.testing@aeso.ca; and

(3) a final commissioning plan for WECC testing and ancillary testing is submitted to the AESO's Operations Coordination group at gen.testing@aeso.ca.

Section 505.4

Section 505.4 focuses on any testing a legal owner may wish to perform after energization and commission are complete. Subsection 2 of section 505.4 sets a deadline of 15 days prior to the desired testing date for for a final, ISO-approved operational testing plan to be in place.

Again, if an approved plan needs to be in place 15 days prior to commencing any tests, it is prudent for a legal owner to submit the plan ahead of the 15 days to allow the AESO sufficient time to review and approve the plan. As a general guideline, the AESO suggests that a legal owner submit a commissioning plan for operational tests at least 30 days in advance of the planned testing to allow time for the AESO to review and approve the plan. Also, when a legal owner knows that a specific operational test occurs at very regular points in time (valve testing, for example), the AESO will accept a single (e.g. semi-annual) submission listing the requested dates for such testing. The legal owner will have to submit any changes to the dates in the grouped submission as appropriate for the AESO to be able to approve the revised dates 15 days in advance of testing.

Furthermore, the AESO wishes to point out that section 505.4 does accommodate testing of a more urgent nature to recover from unexpected operating problems. Legal owners are encouraged to read subsection 3(4) of section 505.4 to understand the specific requirements related to testing of a more urgent nature.

Following is the submission information for commissioning plans relating to section 505.4:

(1) Commissioning plans related to planned operational testing are submitted to the AESO's Operations Coordination group gen.testing@aeso.ca.

(2) Requests for testing of an urgent nature necessary to recover from unexpected operation problems are communicated and coordinated with the AESO System Controller directly. Additional assessment and coordination may involve the AESO's Operations Coordination group.

8 Real Time Approval of Testing

In addition to approving commissioning plans as described above, the legal owner also needs to obtain the AESO`s verbal authorization one hour in advance of the testing, as indicated in subsection 6(2) of section 505.3 and subsection 3(2) of section 505.4. The AESO will provide such approval if the real time conditions of the system allow for the specific tests. If, based on the real time system conditions, the system cannot be operated in a safe and reliable manner, the AESO will work with the legal owner to re-schedule those tests.

9 Information to Include in a Commissioning Plan

Each project differs due to the nature, size, and complexity of the project. Therefore, the information contained in a commissioning plan varies. It is important that a legal owner's commissioning plan include enough information for the AESO toassess the impact those tests may have on the transmission system.

The information required for WECC testing, ancillary services testing, and operational plans also varies. As examples:

(a) WECC testing requires specific mention of both real power and reactive power output levels (net-to-grid);

(b) RATA testing must specify real power output (net-to-grid), but may describe reactive power output (net-to-grid) in a generic manner, such as “As required for real time conditions” or “AVR in automatic mode”; and

(c) transformer commissioning should include the required unloaded soak period.

Any legal owner that is unsure of what to include in a commissioning plan may contact the AESO Project Manager leading the project or the AESO Operations Coordination group (gen.testing@aeso.ca) for direction.

Revision History

2018-09-04	Solar facilty added, updated rule reference to ISO rule 502.16 and 502.6, ancillary service technical requirement reference changed to ISO rules 205.4,205.5 and 205.6
2014-06-26	Email Address Update
2013-11-12	Administrative Updates
2012-12-31	Initial Release