



Document name	Steady State and Dynamic Data Requirements MOD-(11 and 13)-WECC-CRT-1 Regional Criterion
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Version Control

Version	Date	Action	Change Highlights
1	June 26, 2013	Approved by the WECC Board of Directors	Initial version developed in response to NERC Fill-in-the-Blank Standards.



A. Introduction

1. **Title:** Steady State and Dynamic Data Requirements
Regional Criterion
2. **Number:** MOD-(11 and 13)-WECC-CRT-1
3. **Purpose:** To establish the consistent data requirements and reporting procedures whereby data is collected and reported to create an accurate modeling of the Western Interconnection.

This Regional Criterion was developed pursuant to North American Electric Reliability Corporation (NERC) Reliability Standard MOD-011-0 (Standard MOD-011-0 — Regional Steady-State Data Requirements and Reporting Procedures) and MOD-013-1 (Standard MOD-013-1 — RRO Dynamics Data Requirements and Reporting Procedures). Violation of this criterion may result in a violation of NERC Reliability Standard(s) MOD-011-0 and MOD-013-1. Violation of NERC Reliability Standard(s) MOD-011-0 and/or MOD-013-1 may result in financial penalties imposed by NERC.

4. **Applicability**
 - 4.1. **Functional Entities**
 - 4.1.1. Transmission Owner
 - 4.1.2. Transmission Planner
 - 4.1.3. Generator Owner
 - 4.1.4. Resource Planner
 - 4.1.5. Reliability Assurer
5. **Effective Date:** July 1, 2013

6. Background:

The Western Interconnection is designed and operated in accordance with NERC Reliability Standards and Western Electricity Coordinating Council (WECC) Regional Reliability Standards and Criteria. In order to make this possible, WECC staff and members perform power flow and stability studies using computer models of the power system. The accuracy of these models is a key factor in preserving system reliability and affects significant economic decisions regarding system expansion and operation while also meeting the requirements of WECC's annual system study program, WECC regional studies, and WECC path rating studies.

Since the decisions based on the results of system studies are of such importance, system representation must be sufficiently accurate to ensure that system parameters measured in simulating a disturbance are close to those that would be measured on the actual power system under the same conditions.

B. Requirements and Measures

WR1. The Reliability Assurer (WECC) shall verify the System Review Work Group (SRWG), or its successor, develops and documents both comprehensive steady-state and comprehensive dynamic data requirements, and reporting procedures for the Western Interconnection to meet the steady-state data requirements listed in Attachment A (Steady State Data Requirements) and dynamic data requirements list in Attached B (Dynamic Data Requirements) of this criterion.

WM1. The Reliability Assurer (WECC) shall have and produce upon request, evidence that it verified SRWG, or its successor, developed and documented both comprehensive steady-state and comprehensive dynamic data requirements, and reporting procedures for the Western Interconnection to meet the steady-state data requirements listed in Attachment A and dynamic data requirements listed in Attachment B of this criterion, as required in WR1 above. Evidence may include, but is not limited to, production of documentation from the SRWG, or its successor, indicating the required development and documentation was completed.

WR2. The Reliability Assurer (WECC) shall designate the SRWG, or its successor, as the entity responsible to *develop* for the Western Interconnection any additional steady-state and dynamic data requirements not otherwise specified by NERC.

- WM2.** The Reliability Assurer (WECC) shall have and produce upon request, evidence that it designated the SRWG, or its successor, as the entity responsible to *develop* for the Western Interconnection any additional steady-state and dynamic data requirements, as required in WR2 above, not otherwise specified by NERC. Evidence may include, but is not limited to, any form of documented or recorded communication between WECC Staff and the chair of the SRWG, or its successor, indicating the designation was made.
- WR3.** The Reliability Assurer (WECC) shall designate the Planning Coordination Committee, or its successor, as the entity responsible to *approve* the development of both comprehensive steady-state and comprehensive dynamic data requirements, and reporting procedures, within the Western Interconnection, as *developed* by the SRWG, or its successor.
- WM3.** The Reliability Assurer (WECC) shall produce evidence that it designated the Planning Coordination Committee, or its successor, as the entity responsible to *approve* the development of both steady-state and comprehensive dynamic data requirements, and reporting procedures, within the Western Interconnection, as *developed* by the SRWG, or its successor, as required in WR3 above. Evidence of the Planning Coordination Committee's approval of the SRWG's development of the steady-state and dynamic data requirements and reporting procedures, may include, but is not limited to, production of any form of documented or recorded communication between the Reliability Assurer (WECC) and the Chair of the Planning Coordination Committee indicating the required content.
- WR4.** The Reliability Assurer (WECC) shall review this criterion, no less than each five years, by causing to be filed a WECC Standards/Regional Criterion Request Form (or its successor), for the purpose of reviewing the data requirements and reporting procedures addressed herein.
- WM4.** The Reliability Assurer (WECC) shall have and provide upon request, evidence that it reviewed this criterion, no less than each five years, by causing to be filed a WECC Standards/Regional Criterion Request Form (or its successor), for the purpose of reviewing the data requirements and reporting procedures addressed herein, as required in WR4. Evidence may include, but is not limited to, production of the WECC Standards/Regional Criterion Form (or its successor) indicating that the scope of the Request included review of the data requirements and reporting procedures contained in this criterion. (The five-year period for review begins on the Effective Date of this criterion.)

WR5. The Reliability Assurer (WECC) shall post on the WECC Web site each steady-state and dynamic data request required by this criterion, to include, at a minimum, each of the following elements:

- 1) A statement of the purpose for which the case will be developed
- 2) The case year
- 3) The case season
- 4) The case load, generation and interchange requirements
- 5) Required due dates for data submittal to the Reliability Assurer (WECC).

WM5. The Reliability Assurer (WECC) shall have and produce upon request, evidence that it posted on the WECC Web site, each steady-state and dynamic data request required by this criterion, to include each of the elements listed in WR5 above. Evidence may include, but is not limited to, documentation from the WECC Web site or other search engine indicating the posting took place to include the required content.

WR6. The Reliability Assurer (WECC) shall post on the WECC Web site each steady-state and dynamic data request, as referred to in WR5 above, at least eight weeks prior to the required due dates for data submittal back to the Reliability Assurer (WECC).

WM6. The Reliability Assurer (WECC) shall have and produce upon request, evidence that it posted, on the WECC Web site, each steady-state and dynamic data request, as referred to in WR5 above, at least eight weeks prior to the required due dates for data submittal back to the Reliability Assurer (WECC), as is required in WR6. Evidence may include, but is not limited to, documentation from the WECC Web site or other search engine indicating the posting took place to include the required content.

WR7. Each Transmission Owner, Transmission Planner, Generator Owner and Resource Planner as specified in the “Functional Entity” column of Attachment A of this criterion, shall submit to the Reliability Assurer (WECC) the data specified in the “Data Required” column of Attachment A of this criterion, in accordance with the due dates for data submittal to the Reliability Assurer (WECC) specified in WR5 above.

WM7. Each Transmission Owner, Transmission Planner, Generator Owner and Resource Planner as specified in the “Functional Entity” column of Attachment A of this criterion, shall have and produce upon request, evidence that data was submitted to the Reliability Assurer (WECC), as required in WR7 above, reflecting the “Data Required” specified in the “Data Required” column of Attachment A of this criterion, in accordance with the due dates for data submittal specified in WR5 above.

Evidence shall include, but not be limited to, production of email or other notification process communicated to the Reliability Assurer (WECC) indicating inclusion of the data specified from the “Data Required” column of Attachment A and that the date dispatched met the required due date.

WR8. Each Transmission Owner, Transmission Planner, Generator Owner, and Resource Planner as specified in the “Functional Entity” column of Attachment B of this criterion, shall submit to the Reliability Assurer (WECC) the data specified in the “Data Required” column of Attachment B of this criterion, in accordance with the due dates for data submittal to the Reliability Assurer (WECC) specified in WR5 above.

WM8. Each Transmission Owner, Transmission Planner, Generator Owner, and Resource Planner as specified in the “Functional Entity” column of Attachment B of this criterion, shall have and produce upon request, evidence, as required in WR8 above, that data was submitted to the Reliability Assurer (WECC) reflecting the information specified in the “Data Required” column of Attachment B of this criterion, in accordance with the due dates for data submittal specified in WR5 above.

Evidence shall include, but not be limited to, production of email or other notification process communicated to the Reliability Assurer (WECC) indicating inclusion of the data specified from the “Data Required” column of Attachment B and that the date dispatched met the required due date. A report of “No change” is acceptable where there is no new or different data to report.

WR9. Each Generator Owner shall submit to the Reliability Assurer (WECC), the generator data required on Attachments A and B in accordance with the following size-threshold criteria:

- If the individual generator unit capacity is 10 MVA or larger, and is connected to the WECC transmission system at 60 kV or higher, then steady-state data shall be submitted for each generator in accordance with the requirement stated at Attachment A, “NERC Requirement, MOD-11-0, R1.2”, and dynamics data shall be submitted for each generator in accordance with all of Attachment B (excluding Attachment B, “NERC Requirement, MOD-13-1, R1.4.”).
- If the aggregated generator unit capacity is 20 MVA or larger, and is connected to the WECC transmission system at 60 kV or higher, and is not a collector-based generation facility, then steady-state data shall be submitted for each individual generator in accordance with Attachment A, “NERC Requirement, MOD-11-0, R1.2”, and dynamics data shall be submitted for each generator in accordance with all of Attachment B,

excluding Attachment B, “NERC Requirement, MOD-13-1, R1.4.”. (Wind and solar farms are an example of a collector-based generation facility.)

- If the aggregated generation capacity is 20 MVA or larger, and is connected to the WECC transmission system at 60 kV or higher, and is a collector-based generation facility, then steady-state data shall be submitted in accordance with Attachment A, “NERC Requirement, MOD-11-0, R1.2”, and dynamics data shall be submitted in accordance with all of Attachment B (excluding Attachment B, “NERC Requirement, MOD-13-1, R1.4.”) for the aggregated generation capacity as a single-unit generator model. (Wind and solar farms are an example of a collector-based generation facility.)
- All other generating facilities shall either be netted with bus load and steady-state data shall be submitted in accordance with Attachment A, “NERC Requirement, MOD-11-0, R1.1b; or, steady-state data shall be submitted in accordance with Attachment A, “NERC Requirement R1.2”.

WM9. Each Generator Owner shall have and produce upon request, evidence that it submitted to the Reliability Assurer (WECC) the generator data required on Attachments A and B, in accordance with the threshold(s) specified in WR9 above. Evidence may include, but is not limited to, production of the data that was submitted reflecting the information specified in the “Data Required” column of Attachment A and Attachment B of this criterion in accordance with the threshold(s) specified in WR9 above.

WR10. Each Transmission Owner, Transmission Planner, Generator Owner and Resource Planner shall submit steady-state data in accordance with Attachment A, and dynamic data in accordance with Attachment B that is consistent with submitted steady-state data.

WM10. Each Transmission Owner, Transmission Planner, Generator Owner and Resource Planner shall have and produce upon request, evidence that it submitted steady-state data in accordance with Attachment A, and dynamic data in accordance with Attachment B that is consistent with submitted steady-state data, as required in WR10.

(For example, if Attachment A called for “Bus Name” and Attachment B also calls for the same “Bus Name”, the data submitted for both must be identical – i.e. *consistent*.)

WR11. The Reliability Assurer (WECC) shall post on the WECC Web site the approved solved and solvable base-case data and supporting documentation.

WM11.The Reliability Assurer (WECC) shall have and produce upon request, evidence that it posted on the WECC Web site the approved solved and solvable base-case data and supporting documentation for the posted base-case, as required in WR11 above. Evidence may include, but is not limited to, documentation from the WECC Web site or other search engine indicating the posting took place to include the required content.

Attachment A

Steady State Data Requirements (SSDR)

The WECC Steady State Data Requirements (SSDR) contains the minimum acceptable steady state data requirements to meet the requirements of NERC Standard MOD-11-0, Requirements R1.1 through R1.7. Each Responsible Entity listed in the Responsible Entity column below shall submit the below requested information in accordance with this criterion.

The System Review Work Group may add to but not subtract from this list upon approval by the Planning Coordination Committee. The below minimum list is established by NERC Standard.

NERC Requirement	Data Required	Functional Entity
		<i>The below stated Functional Entity shall provide the steady state data described in the "Data Required" column.</i>
MOD-11-0, R1.1a	Bus (substation): name and nominal voltage supplied per Reliability Standards MOD-016-0, MOD-017-0, and MOD-020-0), and location.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-11-0, R1.1b	Bus (substation): electrical demand supplied (consistent with the aggregated and dispersed substation demand data supplied per Reliability Standards MOD-016-0, MOD-017-0, and MOD-020-0).	Each Resource Planner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-11-0, R1.2	Generating Units (including synchronous condensers, pumped storage, etc.): location, minimum and maximum Ratings (net Real and Reactive Power), regulated bus and voltage set point, and equipment status.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-11-0, R1.3	AC Transmission Line or Circuit (overhead and underground): nominal voltage, impedance, line charging, Normal and Emergency Ratings	Each Transmission Owner of the transmission facility represented and each Generator Owner of the

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	(consistent with methodologies defined and Ratings supplied per Reliability Standard FAC-008-0 and FAC-009-0) equipment status, and metering locations.	generation facility represented
MOD-11-0, R1.4	DC Transmission Line (overhead and underground): line parameters, Normal and Emergency Ratings, control parameters, rectifier data, and inverter data.	Transmission Owner
MOD-11-0, R1.5	Transformer (voltage and phase-shifting): nominal voltages of windings, impedance, tap ratios (voltage and/or phase angle or tap step size), regulated bus and voltage set point, Normal and Emergency Ratings (consistent with methodologies defined and Ratings supplied per Reliability Standard FAC-008-0 and FAC-009-0.), and equipment status.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-11-0, R1.6	Reactive Compensation (shunt and series capacitors and reactors): nominal Ratings, impedance, percent compensation, connection point, and controller device.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-11-0, R1.7	Interchange Schedules: Existing and future Interchange Schedules and / or assumptions.	Transmission Planner

Attachment B

Dynamic Data Requirements (DDR)

The WECC Dynamic Data Requirements (DDR) contains the minimum acceptable dynamic data requirements to meet the requirements of NERC Standard MOD-13-1, Requirements R1.1 through R1.5. Each Responsible Entity listed in the Responsible Entity column below shall submit the below requested information in accordance with this criterion.

The System Review Work Group may add to but not subtract from this list upon approval by the Planning Coordination Committee. The below minimum list is established by NERC Standards.

NERC Requirement	Data Required	Functional Entity
		<i>The below stated Functional Entity shall provide the dynamic data described in the "Data Required" column.</i>
MOD-13-1, R1.1	Design data shall be provided for new or refurbished excitation systems (for synchronous generators and synchronous condensers) at least three months prior to the installation date.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-13-1, R1.1.1	If design data is unavailable from the manufacturer 3 months prior to the installation date, estimated or typical manufacturer's data, based on excitation systems of similar design and characteristics, shall be provided.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-13-1, R1.2	Unit-specific dynamics data shall be reported for generators and synchronous condensers (including, as appropriate to the model, items such as inertia constant, damping coefficient, saturation parameters, and direct and quadrature axes reactances and time constants), excitation systems, voltage regulators, turbine-governor systems, power system stabilizers, and other associated	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented

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	generation equipment.	
MOD-13-1, R1.2.1	Estimated or typical manufacturer's dynamics data, based on units of similar design and characteristics, may be submitted when unit-specific dynamics data cannot be obtained. In no case shall other than unit-specific data be reported for generator units installed after 1990.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-13-1, R1.2.2	The Interconnection-wide requirements shall specify unit size thresholds for permitting: 1) The use of non-detailed vs. detailed models, 2) The netting of small generating units with bus load, and 3) The combining of multiple generating units at one plant.	Refer to WR9 above. (The Functional Entity as identified in WR9 is the Reliability Assurer.)
MOD-13-1, R1.3	Device specific dynamics data shall be reported for dynamic devices, including, among others, static VAR controllers, high voltage direct current systems, flexible AC transmission systems, and static compensators.	Each Transmission Owner of the transmission facility represented and each Generator Owner of the generation facility represented
MOD-13-1, R1.4	Dynamics data representing electrical Demand characteristics as a function of frequency and voltage.	Transmission Owner
MOD-13-1, R1.5	Dynamics data shall be consistent with the reported steady-state (power flow) data supplied per Reliability Standard MOD-010 Requirement 1.	Refer to WR10 above.

Guideline and Technical Basis

This criterion was developed on the then-existing versions of the below listed documents:

- MOD-11-0 Regional Steady State Data Requirements and Reporting Procedures
- MOD-13-1 RRO Dynamic Data Requirements and Reporting Procedures
- WECC Data Preparation Manual
- System Review Work Group (SRWG) Handbook