

## Project 2007-09 Generator Verification Implementation Plan

### Implementation Plan for MOD-026-1, Verification of Models and Data for Generator Excitation Control System and Plant Volt/Var Control Functions

#### Approvals Requested

MOD-026-1 - Verification of Models and Data for Generator Excitation Control System and Plant Volt/Var Control Functions

#### Prerequisite Approvals

None

#### Revisions to Approved Standards and Definitions

None

#### Compliance with the Standard

**The following entities are responsible for being compliant with all requirements of MOD-026-1:**

- Transmission Planner
- Generator Owner

- Facilities

For the purpose of this standard, the following Facilities are considered, “applicable units<sup>1</sup>.” Units or plants with an average capacity<sup>2</sup> factor greater than 5% over the last three calendar years, beginning on January 1 and ending on December 31, that meet the following:

<sup>1</sup> Applicable generating units do not include startup or standby units not normally connected to the grid.

<sup>2</sup> Once a capacity factor exemption is declared by notifying the Transmission Planner, verification is not required for 10 calendar years from the date eligibility occurs. At the end of this 10 calendar year timeframe, the current average 3 year capacity factor (for years 8, 9, and 10) is examined to determine if the capacity factor exemption can be declared for the next 10 calendar year period. If not eligible for the capacity factor exemption, then model verification must be completed within one year of the date the capacity factor exemption expired with the 10 calendar year periodicity requirement reset based on the verification date.

Generating units connected to the Eastern or Quebec Interconnections with the following characteristics:

- Individual generating unit greater than 100 MVA (gross nameplate rating) directly connected to the bulk power system.
- For each generating plant / Facility consisting of one or more units that are connected to the bulk power system at a common bus with total generation greater than 100 MVA (gross aggregate rating):
  - Each individual generating unit greater than 20 MVA (gross nameplate rating); and
  - Each generating plant / Facility comprised consisting of individual generating units less than 20 MVA (gross nameplate ratings)

Generating units connected to the Western Interconnection with the following characteristics:

- Individual generating unit greater than 75 MVA (gross nameplate rating) directly connected to the bulk power system.
- For each generating plant / Facility consisting of one or more units that are connected to the bulk power system at a common bus with total generation greater than 75 MVA (gross aggregate rating):
  - Each individual generating unit greater than 20 MVA (gross nameplate rating); and
  - Each generating plant / Facility comprised consisting of individual generating units less than 20 MVA (gross nameplate ratings)

Generating units connected to the ERCOT Interconnection with the following characteristics:

- Individual generating unit greater than 50 MVA (gross nameplate rating) directly connected to the bulk power system.
- For each generating plant / Facility consisting of one or more units that are connected to the bulk power system at a common bus with total generation greater than 75 MVA (gross aggregate rating):
  - Each individual generating unit greater than 20 MVA (gross nameplate rating); and
  - Each generating plant / Facility comprised consisting of individual generating units less than 20 MVA (gross nameplate ratings)

For all Interconnections:

- Any registered technically justified<sup>3</sup> unit requested by the Planning Coordinator.

~~Generating units connected to the Eastern or Quebec Interconnection with the following characteristics:~~

- ~~Each generating unit with a gross nameplate rating greater than or equal to 100 MVA, connected at the point of interconnection<sup>4</sup> with rating greater than or equal to 100 kV.~~
- ~~For each plant with a gross aggregate nameplate rating greater than or equal to 100 MVA, connected at the same point of interconnection with rating greater than or equal to 100 kV:~~
  - ~~Each unit with a gross nameplate rating greater than or equal to 20 MVA; and~~
  - ~~The remainder of the plant as an aggregate.~~

~~Generating units connected to the Western Interconnection with the following characteristics:~~

- ~~Each generating unit with a gross nameplate rating greater than or equal to 75 MVA, connected at the point of interconnection<sup>2</sup> with rating greater than or equal to 100 kV.~~
- ~~For each plant with a gross aggregate nameplate rating greater than or equal to 75 MVA, connected at the same point of interconnection with rating greater than or equal to 100 kV:~~
  - ~~Each unit with a gross nameplate rating greater than or equal to 20 MVA; and~~
  - ~~The remainder of the plant as an aggregate.~~

~~Generating units connected to the ERCOT Interconnection with the following characteristics:~~

- ~~Each generating unit with a gross nameplate rating greater than or equal to 50 MVA, connected at the point of interconnection<sup>2</sup> with rating greater than or equal to 100 kV.~~
- ~~For each plant with a gross aggregate nameplate rating greater than or equal to 75 MVA, connected at the same point of interconnection with rating greater than or equal to 100 kV:~~
  - ~~Each unit with a gross nameplate rating greater than or equal to 20 MVA; and~~

<sup>3</sup> Technical justification is achieved by demonstrating that the simulated unit or plant response does not match the measured unit or plant response.

<sup>4</sup> ~~The common transmission bus voltage level at which the generator step-up transformer is connected.~~

~~○ The remainder of the plant as an aggregate.~~

~~For all interconnections:~~

- ~~● Any technically justified<sup>5</sup> unit requested by the Planning Coordinator.~~

## Effective Date

In those jurisdictions where regulatory approval is required:

- Each responsible entity shall ensure compliance with Requirements R1, and R3 through R6 By the first day of the first calendar quarter, four years following applicable regulatory approval.
- Each Generator Owner shall ensure at least 30% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, four years following applicable regulatory approval.
- Each Generator Owner shall ensure at least 50% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, six years following applicable regulatory approval.
- Each Generator Owner shall ensure 100% of its applicable units are compliant with Requirement R2 By the first day of the first calendar quarter, ten years following applicable regulatory approval.

In those jurisdictions where no regulatory approval is required:

- Each responsible entity shall ensure compliance with Requirements R1, and R3 through R6 by the first day of the first calendar quarter, four years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 30% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, four years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 50% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 By the first day of the first calendar quarter, six years following Board of Trustees adoption.

<sup>5</sup>-A technical justification for verifying each of those units or plant(s) that demonstrates through simulation and/or measured response that the unit or plant affects a stability limit, or evidence that the simulated unit or plant response does not match measured unit or plant response.

Each Generator Owner shall ensure 100% of its applicable units are compliant with Requirement R2 By the first day of the first calendar quarter, ten years following Board of Trustees adoption.~~In those jurisdictions where regulatory approval is required:~~

~~By the first day of the first calendar quarter, four years following applicable regulatory approval:~~

- ~~• Each Generator Owner shall ensure at least 30% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2.~~
- ~~• Each responsible entity shall ensure compliance with Requirements R1, and R3 through R6.~~

~~By the first day of the first calendar quarter, six years following applicable regulatory approval:~~

- ~~• Each Generator Owner shall ensure at least 50% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2.~~

~~By the first day of the first calendar quarter, ten years following applicable regulatory approval:~~

- ~~• Each Generator Owner shall ensure 100% of its applicable units are compliant with Requirement R2.~~

~~In those jurisdictions where no regulatory approval is required:~~

~~By the first day of the first calendar quarter, four years following Board of Trustees adoption:~~

- ~~• Each Generator Owner shall ensure at least 30% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2.~~
- ~~• Each responsible entity shall ensure compliance with Requirements R1, and R3 through R6.~~

~~By the first day of the first calendar quarter, six years following Board of Trustees adoption:~~

- ~~• Each Generator Owner shall ensure at least 50% of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2.~~

~~By the first day of the first calendar quarter, ten years following Board of Trustees adoption:~~

- ~~• Each Generator Owner shall ensure 100% of its applicable units are compliant with Requirement R2.~~

### Consideration for Early Compliance

Existing excitation control system and plant volt/var control model verification is sufficient for demonstrating compliance for a ten year period from the actual verification date if either of the following applies:

- The Generator Owner has a verified model that is compliant with the applicable regional entity policies, guidelines or criteria existing at the time of model verification, or
- The Generator Owner has an existing verified model that is compliant with the requirements of this standard.

Justification

This phased implementation supports the ten year cycle for the collection of generator response data necessary for required verifications and typical generating unit outage schedules.

When a Generator Owner has verified its Excitation Control System and Plant Volt/Var Control model(s) in compliance with its regional entity requirements ten years or less prior to the approval date of this Standard, these verifications are deemed sufficient for demonstrating compliance with this Standard for a ten year period from the date of the aforementioned verification.