

Project 2007-09 Generator Verification Implementation Plan

Implementation Plan for MOD-027-1, Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency Control Functions

Approvals Requested

MOD-027-1 – Verification of Models and Data for Turbine/Governor and Load Control or Active Power/Frequency 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-027-1:

- Transmission Planner
- Generator Owner

- Facilities

For the purpose of this standard, the following Facilities are considered, “applicable units.¹” Units or plants with an average capacity² factor greater than 5% over the last three calendar years, beginning on January 1 and ending on December 31, that meet the following:

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

² 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. For the definition of capacity factor, refer to Appendix F of the GADS Data Reporting Instructions on the NERC website.

- 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 or generating 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 or generating Facility 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 or generating 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 or generating 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 or generating 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 or generating Facility comprised of individual generating units less than 20 MVA (gross nameplate ratings)

~~Each generating unit with a gross nameplate rating greater than or equal to 100 MVA, connected at the point of interconnection³ at 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 at 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 interconnection³ at 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 at greater than or equal to 100 kV:~~

~~Each unit with a gross nameplate 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 of greater than or equal to 50 MVA, connected at the point of interconnection³ with rating greater than or equal to 100 kV.~~

~~For each plant with a gross aggregate nameplate rating of greater than or equal to 75 MVA, connected at the same point of interconnection at greater than or equal to 100 kV:~~

~~Each unit with a gross nameplate greater than or equal to 20 MVA; and~~

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

Effective Date

In those jurisdictions where regulatory approval is required:

- Each responsible entity shall ensure compliance with Requirements R1, and R3 through R5 by the first day of the first calendar quarter, three years following applicable regulatory approval.
- Each Generator Owner shall ensure at least 25 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the

³ The common transmission bus voltage level (i.e., 100 kV or greater) at which the generator step-up transformer is connected.

first day of the first calendar quarter, three years following applicable regulatory approval.

- Each Generator Owner shall ensure at least 50 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, five years following applicable regulatory approval.
- Each Generator Owner shall ensure at least 75 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, seven years following applicable regulatory approval.
- Each Generator Owner shall ensure at least 100 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, nine 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 R5 by the first day of the first calendar quarter, three years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 25 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, three years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 50 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, five years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 75 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, seven years following Board of Trustees adoption.
- Each Generator Owner shall ensure at least 100 percent of its applicable units per Interconnection on an MVA basis are compliant with Requirement R2 by the first day of the first calendar quarter, nine years following Board of Trustees adoption.

~~In those jurisdictions where regulatory approval is required:~~

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

- ~~• At least 25% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~
- ~~• 100% compliant with Requirements R1, and R3 through R5.~~

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

- ~~• At least 50% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~

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

- ~~• At least 75% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~

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

- ~~• 100% of each Generator Owner's applicable units compliant with Requirement R2.~~

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

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

- ~~• At least 25% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~
- ~~• 100% compliant with Requirements R1, and R3 through R5.~~

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

- ~~• At least 50% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~

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

- ~~• At least 75% of each Generator Owner's applicable units per Interconnection on an MVA basis compliant with Requirement R2.~~

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

- ~~• 100% of each Generator Owner's applicable units compliant with Requirement R2.~~

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, and it also provides ample time for Generator Owners to either purchase new

recording equipment as required or to make necessary modifications to existing recording equipment (frequency triggers, length of recordings for frequency excursions, additional event storage capacity, etc).

Consideration for Early Compliance

Existing turbine/governor and load control or active power/frequency 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.
- The Generator Owner has an existing verified model that is compliant with the requirements of this standard.