

**Reliability Standard Audit Worksheet[[1]](#footnote-1)**

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

***This section to be completed by the Compliance Enforcement Authority.***

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| **Audit ID:** | Audit ID if available; or REG-NCRnnnnn-YYYYMMDD |
| **Registered Entity:** | Registered name of entity being audited |
| **NCR Number:** | NCRnnnnn |
| **Compliance Enforcement Authority:** | Region or NERC performing audit |
| **Compliance Assessment Date(s)[[2]](#footnote-2):** | Month DD, YYYY, to Month DD, YYYY |
| **Compliance Monitoring Method:** | [On-site Audit | Off-site Audit | Spot Check] |
| **Names of Auditors:** | Supplied by CEA |

# **Applicability of Requirements**

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| **R1** |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |
| **R2** |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
| **R3** |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
| **R4** |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
| **R5** |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |

**Legend:**

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| Text with blue background: | Fixed text – do not edit |
| Text entry area with Green background: | Entity-supplied information |
| Text entry area with white background: | Auditor-supplied information |

Findings

**(This section to be completed by the Compliance Enforcement Authority)**

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| **Req.** | **Finding** | **Summary and Documentation** | **Functions Monitored** |
| **R1** |  |  |  |
| **R2** |  |  |  |
| **R3** |  |  |  |
| **R4** |  |  |  |
| **R5** |  |  |  |

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| **Req.** | **Areas of Concern** |
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| **Req.** | **Recommendations** |
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| **Req.** | **Positive Observations** |
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Effective Dates

United States

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| Standard | Requirement | Effective Date | Applicable % Unit Gross MVA |
| MOD-027-1 | R1. | 07/01/2014 |  |
| MOD-027-1 | R2. | 07/01/2018 | 30% |
| MOD-027-1 | R2. | 07/01/2020 | 50% |
| MOD-027-1 | R2. | 07/01/2024 | 100% |
| MOD-027-1 | R3. | 07/01/2014 |  |
| MOD-027-1 | R4. | 07/01/2014 |  |
| MOD-027-1 | R5. | 07/01/2014 |  |

Applicability

4.1. Functional Entities

4.1.1 Generator Owner

4.1.2 Transmission Planner

Facilities

For the purpose of the requirements contained herein, Facilities that are directly connected to the Bulk Electric System (BES) will be collectively referred to as an “applicable unit” that meet the following:

4.2.1 Generation in the Eastern or Quebec Interconnections with the following characteristics:

4.2.1.1 Individual generating unit greater than 100 MVA (gross nameplate rating).

4.2.1.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 100 MVA (gross aggregate nameplate rating).

4.2.2 Generation in the Western Interconnection with the following characteristics:

4.2.2.1 Individual generating unit greater than 75 MVA (gross nameplate rating).

4.2.2.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 75 MVA (gross aggregate nameplate rating).

4.2.3 Generation in the ERCOT Interconnection with the following characteristics:

4.2.3.1 Individual generating unit greater than 50 MVA (gross nameplate rating).

4.2.3.2 Individual generating plant consisting of multiple generating units that are directly connected at a common BES bus with total generation greater than 75 MVA (gross aggregate nameplate rating).

Subject Matter Experts

Identify the Subject Matter Expert(s) responsible for this Reliability Standard.

**Registered Entity Response (Required):**

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| **SME Name** | **Title** | **Organization** | **Requirement(s)** |
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R1 Supporting Evidence and Documentation

1. Each Transmission Planner shall provide the following requested information to the Generator Owner within 90 calendar days of receiving a written request:
   * Instructions on how to obtain the list of turbine/governor and load control or active power/frequency control system models that are acceptable to the Transmission Planner for use in dynamic simulation,
   * Instructions on how to obtain the dynamic turbine/governor and load control or active power/frequency control function model library block diagrams and/or data sheets for models that are acceptable to the Transmission Planner, or
   * Model data for any of the Generator Owner’s existing applicable unit specific turbine/governor and load control or active power/frequency control system contained in the Transmission Planner’s dynamic database from the current (in-use) models.
2. The Transmission Planner must have and provide the dated request for instructions or data, the transmitted instruction or data, and dated evidence of a written transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) as evidence that it provided the request within 90 calendar days in accordance with Requirement R1.

**Registered Entity Response (Required):**

**Question:** Did the entity receive a written request from a Generator Owner to provide instructions or model data as specified in R1 during the compliance monitoring period?

Yes  No

If Yes, provide a list of the requests and provide evidence of compliance.

If No, provide a description of the process used to ascertain such requests were not received.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

**Registered Entity Response (Required):**

**Compliance Narrative:**

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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| **The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.** | | | | | |
| **File Name** | **Document Title** | **Revision or Version** | **Document Date** | **Relevant Page(s) or Section(s)** | **Description of Applicability of Document** |
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to MOD-027-1, R1

***This section to be completed by the Compliance Enforcement Authority***

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| Evaluate if the entity provided requested information to Generator Owners: | |
|  | Review the list of written requests from Generator Owners related to the following:   * Instructions on how to obtain the list of system models acceptable to the Transmission Planner for use in dynamic simulation, * Instructions on how to obtain the dynamic model library block diagrams and/or data sheets for models acceptable to the Transmission Planner, or * Model data for any of the Generator Owner’s existing unit specific system contained in the Transmission Planner’s dynamic database from current (in-use) models. |
|  | Review entity responses to the written requests. |
|  | Verify the response was provided within 90 calendar days. |
|  | Verify the response provided the requested information specified in R1. |
| **Note to Auditor:** A “turbine/governor and load control” applies to conventional synchronous generators.  An “active power/frequency control” applies to inverter connected generators often found at variable energy facilities such as wind and solar farms. | |

Auditor Notes:

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R2 Supporting Evidence and Documentation

1. Each Generator Owner shall provide, for each applicable unit, a verified turbine/governor and load control or active power/frequency control model, including documentation and data (as specified in Part 2.1) to its Transmission Planner in accordance with the periodicity specified in MOD-027 Attachment 1.
   1. Each applicable unit’s model shall be verified by the Generator Owner using one or more models acceptable to the Transmission Planner. Verification for individual units rated less than 20 MVA (gross nameplate rating) in a generating plant (per Section 4.2.1.2, 4.2.2.2, or 4.2.3.2) may be performed using either individual unit or aggregate unit model(s) or both. Each verification shall include the following:
      1. Documentation comparing the applicable unit’s MW model response to the recorded MW response for either:

* A frequency excursion from a system disturbance that meets MOD-027 Attachment 1 Note 1 with the applicable unit on-line,
* A speed governor reference change with the applicable unit on-line, or
* A partial load rejection test,**2**
  + 1. Type of governor and load control or active power control/frequency control**[[3]](#footnote-3)** equipment,
    2. A description of the turbine (e.g. for hydro turbine - Kaplan, Francis, or Pelton; for steam turbine - boiler type, normal fuel type, and turbine type; for gas turbine - the type and manufacturer; for variable energy plant - type and manufacturer),
    3. Model structure and data for turbine/governor and load control or active power/frequency control, and
    4. Representation of the real power response effects of outer loop controls (such as operator set point controls, and load control but excluding AGC control) that would override the governor response (including blocked or nonfunctioning governors or modes of operation that limit Frequency Response), if applicable.

1. The Generator Owner must have and provide dated evidence it verified each generator turbine/governor and load control or active power/frequency control model according to Part 2.1 for each applicable unit and a dated transmittal (e.g., electronic mail message, postal receipt, or *confirmation of facsimile) as evidence it provided the model, documentation, and data to its Transmission Planner, in accordance with Requirement R2.*

**Registered Entity Response (Required):**

**Question:** Did the entity own generating units per Applicability Section 4.2?

Yes  No

If Yes, provide a list of applicable units gross MVA for each Interconnection.

If No, how was the determination of applicable units ascertained?

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

**Registered Entity Response (Required):**

**Compliance Narrative:**

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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| **The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.** | | | | | |
| **File Name** | **Document Title** | **Revision or Version** | **Document Date** | **Relevant Page(s) or Section(s)** | **Description of Applicability of Document** |
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to MOD-027-1, R2

***This section to be completed by the Compliance Enforcement Authority***

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| Evaluate if the entity provided for each applicable unit, a verified turbine/governor and load control or active power/frequency control model to its Transmission Planner: | |
|  | Verify the entity provided the verified control models, documentation, and data to the Transmission Planner in accordance with the periodicity specified in MOD-027-1 Attachment 1. |
|  | Validate each model was verified using models acceptable to the Transmission Planner (R2.1): |
|  | Confirm the verification included:   * Documentation comparing the unit’s MW model response to the recorded MW response for either (R2.1.1):   + A frequency excursion,   + A speed governor reference change with the unit on-line, or   + A partial load rejection test.**2** |
|  | Confirm the verification included:   * Type of governor and load control or active power control/frequency control equipment (R2.1.2) |
|  | Confirm the verification included:   * A description of the turbine (R2.1.3). Examples include:   + Hydro Turbine: Kaplan, Francis or Pelton   + Steam Turbine: boiler type, normal fuel type, and turbine type   + Gas Turbine: type and manufacturer   + Variable Energy: type and manufacturer |
|  | Confirm the verification included:   * Model structure and data for turbine/generator and load control or active power/frequency control (R2.1.4) |
|  | Confirm the verification included:   * Representation of real power response effects of outer loop controls that would override the governor response, if applicable (R2.1.5). Examples include:   + Operator set point controls   + Load control, excluding AGC control   + Blocked or nonfunctioning governors   + Modes of operation that limit Frequency Response |
| Note to Auditor:  A “turbine/governor and load control” applies to conventional synchronous generators.  An “active power/frequency control” applies to inverter connected generators often found at variable energy facilities such as wind and solar farms.  Auditor must confirm applicable generator units for model verification are accurate per the applicability section. The effective date for R2 is based on the Standard Effective Date section 5.2-5.4. The effective date of Requirement 2 provides a 10 year phase-in for compliance for applicable generation units. Specifically 30% of the entity’s applicable unit gross MVA for each Interconnection shall be compliant by July 1, 2018, 50% by July 1, 2020 and 100% by July 1, 2024. See Attachment 1 Model Verification Periodicity Table in the Additional Information Section of the Standard.  MOD-027 Attachment 1: *Turbine/Governor and Load Control or Active Power/Frequency Control Model Periodicity* includes the following titled, *NOTE 3: Consideration for early compliance*  Existing turbine/governor and load control or active power/frequency control model verification is sufficient for demonstrating compliance for a 10 year period from the actual transmittal date if either of the following applies:   * The Generator Owner has a verified model that is compliant with the applicable regional 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.   Verification of units rated less than 20 MVA in a plant connected at a common BES bus with total generation greater than 75 MVA, may be performed using either individual unit or aggregate unit model(s) or both per R2.1.  See Footnote #2 for explanation of the differences between the control mode tested and the final simulation model. | |

Auditor Notes:

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R3 Supporting Evidence and Documentation

1. Each Generator Owner shall provide a written response to its Transmission Planner within 90 calendar days of receiving one of the following items for an applicable unit.
   * + Written notification, from its Transmission Planner (in accordance with Requirement R5) that the turbine/governor and load control or active power/frequency control model is not “usable,”
     + Written comments from its Transmission Planner identifying technical concerns with the verification documentation related to the turbine/governor and load control or active power/frequency control model, or
     + Written comments and supporting evidence from its Transmission Planner indicating that the simulated turbine/governor and load control or active power/frequency control response did not approximate the recorded response for three or more transmission system events.

The written response shall contain either the technical basis for maintaining the current model, the model changes, or a plan to perform model verification**[[4]](#footnote-4)** (in accordance with Requirement R2).

1. Evidence for Requirement R3 must include the Generator Owner’s dated written response containing the information identified in Requirement R3 and dated evidence of transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) of the response.

**Registered Entity Response (Required):**

**Question:** Did the entity receive written notification or comments from its Transmission Planner for any of the issues identified in R3 for an applicable unit in the compliance monitoring period?

Yes  No

If Yes, provide a list of such notifications or comments and evidence to demonstrate compliance.

If No, provide a description of the process used to ascertain no such notifications/comments were received.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

**Registered Entity Response (Required):**

**Compliance Narrative:**

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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| **The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.** | | | | | |
| **File Name** | **Document Title** | **Revision or Version** | **Document Date** | **Relevant Page(s) or Section(s)** | **Description of Applicability of Document** |
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Audit Team Evidence Reviewed (This section to be completed by the Compliance Enforcement Authority):

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Compliance Assessment Approach Specific to MOD-027-1, R3

***This section to be completed by the Compliance Enforcement Authority***

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| Evaluate if the entity provided a written response to its Transmission Planner: | |
|  | Review the list of notifications or comments the entity received for any of the following:   * notification the model was not “usable” * comments identifying technical concerns with the verification documentation related to the model * comments and supporting evidence indicating the simulated control response did not approximate the recorded response for three or more transmission events |
|  | Review entity written responses to the written notification or comments |
|  | Verify the response was provided within 90 calendar days |
|  | Verify the response addressed the notification or comments and included at least one of the following:   * technical basis for maintaining the current model, * the model changes, or * a plan to perform model verification in accordance with R2**4** |
| **Note to Auditor:** A “turbine/governor and load control” applies to conventional synchronous generators.  An “active power/frequency control” applies to inverter connected generators often found at variable energy facilities such as wind and solar farms.  R3 applies only to the notifications or comments received dealing with one of the three bulleted topics. Notifications or comments received on topics unrelated to the bulleted items do not apply under R3.  See Footnote #4:  *If verification is performed, the 10 year period as outlined in MOD-027 Attachment 1 is reset.* | |

Auditor Notes:

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R4 Supporting Evidence and Documentation

1. Each Generator Owner shall provide revised model data or plans to perform model verification**[[5]](#footnote-5)** (in accordance with Requirement R2) for an applicable unit to its Transmission Planner within 180 calendar days of making changes to the turbine/governor and load control or active power/frequency control system that alter the equipment response characteristic**[[6]](#footnote-6)**.
2. Evidence for Requirement R4 must include, for each of the Generator Owner’s applicable units for which system changes specified in Requirement R4 were made, dated revised model data or dated plans to perform a model verification and dated evidence of transmittal (e.g., electronic mail message, postal receipt, or confirmation of facsimile) within 180 calendar days of making changes.

**Question:** Did the entity make changes to the turbine/governor and load control or active power/frequency control system that altered the equipment response characteristic during the compliance monitoring period?

Yes  No

If Yes, provide a list of the changes and verify submission of evidence to demonstrate compliance.

If No, provide a description of the process used to ascertain no such changes were implemented.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

**Registered Entity Response (Required):**

**Compliance Narrative:**

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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| **The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.** | | | | | |
| **File Name** | **Document Title** | **Revision or Version** | **Document Date** | **Relevant Page(s) or Section(s)** | **Description of Applicability of Document** |
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Compliance Assessment Approach Specific to MOD-027-1, R4

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| Evaluate if the entity provided revised model data or plans to perform model verification**5** to its Transmission Planner: | |
|  | Review the list of revised model data or plans for each applicable generator:   * Includes the changes made to the control system that altered the equipment response characteristic**6** |
|  | Verify the revised model data or plans were provided within 180 calendar days of making the changes. |
| **Note to Auditor:** A “turbine/governor and load control” applies to conventional synchronous generators.  An “active power/frequency control” applies to inverter connected generators often found at variable energy facilities such as wind and solar farms.  See Footnote #4:  If verification is performed, the 10 year period as outlined in MOD-027 Attachment 1 is reset.  See Footnote #6 for examples of changes that may alter the equipment response characteristic. | |

Auditor Notes:

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R5 Supporting Evidence and Documentation

1. Each Transmission Planner shall provide a written response to the Generator Owner within 90 calendar days of receiving the turbine/governor and load control or active power/frequency control system verified model information in accordance with Requirement R2 that the model is usable (meets the criteria specified in Parts 5.1 through 5.3) or is not usable.
   1. The turbine/governor and load control or active power/frequency control function model initializes to compute modeling data without error,
   2. A no-disturbance simulation results in negligible transients, and
   3. For an otherwise stable simulation, a disturbance simulation results in the turbine/governor and load control or active power/frequency control model exhibiting positive damping.

If the model is not usable, the Transmission Planner shall provide a technical description of why the model is not usable.

1. Evidence of Requirement R5 must include, for each model received, the dated response indicating the model was usable or not usable according to the criteria specified in Parts 5.1 through 5.3 and for a model that is not useable, a technical description is the model is not usable, and dated evidence of transmittal (e.g., electronic mail messages, postal receipts, or confirmation of facsimile) that the Generator Owner was notified within 90 calendar days of receipt of model information in accordance with Requirement R5.

**Question:** Did the entity receive verified model information from a Generator Owner in accordance with Requirement R2 during the compliance monitoring period?

Yes  No

If Yes, provide a list of the verified model information received and verify submission of evidence to demonstrate compliance.

If No, provide a description of the process used to ascertain that verified model information was not received.

[Note: A separate spreadsheet or other document may be used. If so, provide the document reference below.]

**Registered Entity Response (Required):**

**Compliance Narrative:**

Provide a brief explanation, in your own words, of how you comply with this Requirement. References to supplied evidence, including links to the appropriate page, are recommended.

Registered Entity Evidence (Required):

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| **The following information is requested for each document submitted as evidence. Also, evidence submitted should be highlighted and bookmarked, as appropriate, to identify the exact location where evidence of compliance may be found.** | | | | | |
| **File Name** | **Document Title** | **Revision or Version** | **Document Date** | **Relevant Page(s) or Section(s)** | **Description of Applicability of Document** |
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Compliance Assessment Approach Specific to MOD-027-1, R5

***This section to be completed by the Compliance Enforcement Authority***

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| Evaluate if the entity provided a written response to the Generator Owner: | |
|  | Review the list of received verified model information in accordance with R2 |
|  | Verify the entity written responses to the Generator Owner state whether the model was “usable:”   * (5.1) The model initializes to compute modeling data without error, * (5.2) A no-disturbance simulation results in negligible transients, and * (5.3) For an otherwise stable simulation, a disturbance simulation results in the model exhibiting positive damping. |
|  | If model was “not usable,” verify the entity written response provided a technical description of why the model was not usable. |
|  | Verify the response was provided within 90 calendar days or receiving the verified model information |
| **Note to Auditor:** A “turbine/governor and load control” applies to conventional synchronous generators.  An “active power/frequency control” applies to inverter connected generators often found at variable energy facilities such as wind and solar farms. | |

Auditor Notes:

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Additional Information

Reliability Standard



The full text of STD-MOD-027-1 may be found on the NERC Web Site (www.nerc.com) under “Program Areas & Departments,” “Reliability Standards.”

In addition to the Reliability Standard, there is an applicable Implementation Plan available on the NERC Web Site.

In addition to the Reliability Standard, there is background information available on the NERC Web Site.

Capitalized terms in the Reliability Standard refer to terms in the NERC Glossary, which may be found on the NERC Web Site.

Sampling Methodology

Sampling is essential for auditing compliance with NERC Reliability Standards since it is not always possible

or practical to test 100% of either the equipment, documentation, or both, associated with the full suite of enforceable standards. The Sampling Methodology Guidelines and Criteria (see NERC website), or sample guidelines, provided by the Electric Reliability Organization help to establish a minimum sample set for monitoring and enforcement uses in audits of NERC Reliability Standards.

Regulatory Language

The Commission approved MOD-027-1 on March 20, 2014. Generator Verification Reliability Standards, Order No. 796, 79 Fed. Reg. 17011 (Mar. 27, 2014), 146 FERC ¶ 61,213 (2014).

<http://www.nerc.com/FilingsOrders/us/FERCOrdersRules/E-4.pdf>

Higher MVA Applicability Threshold

P 37 The Commission found that the higher applicability thresholds of Reliability Standards MOD-026-1 and MOD-027-1 are appropriate for a continent-wide standard. The Commission indicated that: “Section 4.2.4 of Reliability Standard MOD-026-1 allows transmission planners to request a model review and related verification information in accordance with Requirement R5 from generators below the applicability threshold when ‘technically justified’ (where the simulated unit or plant response does not match the measured unit or plant response).” The Commission also stated that: “the higher applicability threshold does not excuse generator owners with small units from the expectation that estimated model data they provide to transmission planners for use in simulations will be accurate.”

“Technically Justified” Provision

P 51. The Commission found that “the technical justification provision is not workable in MOD-027-1 because there is more subjectivity involved in verifying the data pertaining to turbine/governors, the equipment subject to the modeling verification requirements of MOD-027-1.” The Commission stated that “determining whether the difference between a model response and a measured response reflects a model defect is subjective and, therefore, the technical justification provision is inappropriate for MOD-027-1.”

Violation Severity Level for MOD-027-1, Requirement R5

P 57. The Commission summarized its concern expressed in the NOPR regarding the proposed violation severity level for Requirement R6 of MOD-026-1 and Requirement R5 of MOD-027-1. Specifically, the Commission indicated that NERC did not propose any violation severity level for a violation of the last sentence of these requirements: “If the model is not useable, the [transmission planner] shall provide a technical description of why the model is not useable.” The Commission noted in the NOPR that compliance with this obligation is no less important than compliance with the other obligations of these requirements. The Commission further stated that the lack of a violation severity level for this type of violation is inconsistent with the Commission’s Violation Severity Level Guideline 3, because the proposed violation severity level does not address all of the obligations in these requirements.

P 58. The Commission directed NERC to “submit a violation severity level that addresses a transmission planner’s obligation to provide a technical description of why a model submitted by a generation owner is not usable for Requirement R6 of MOD-026-1 and Requirement R5 of MOD-027-1.”

Revision History for RSAW

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| **Version** | **Date** | **Reviewers** | **Revision Description** |
| 1 | 06/12/2014 | RSAW Task Force | New Document |
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1. NERC developed this Reliability Standard Audit Worksheet (RSAW) language in order to facilitate NERC’s and the Regional Entities’ assessment of a registered entity’s compliance with this Reliability Standard. The NERC RSAW language is written to specific versions of each NERC Reliability Standard. Entities using this RSAW should choose the version of the RSAW applicable to the Reliability Standard being assessed. While the information included in this RSAW provides some of the methodology that NERC has elected to use to assess compliance with the requirements of the Reliability Standard, this document should not be treated as a substitute for the Reliability Standard or viewed as additional Reliability Standard requirements. In all cases, the Regional Entity should rely on the language contained in the Reliability Standard itself, and not on the language contained in this RSAW, to determine compliance with the Reliability Standard. NERC’s Reliability Standards can be found on NERC’s website. Additionally, NERC Reliability Standards are updated frequently, and this RSAW may not necessarily be updated with the same frequency. Therefore, it is imperative that entities treat this RSAW as a reference document only, and not as a substitute or replacement for the Reliability Standard. It is the responsibility of the registered entity to verify its compliance with the latest approved version of the Reliability Standards, by the applicable governmental authority, relevant to its registration status.

   The NERC RSAW language contained within this document provides a non‑exclusive list, for informational purposes only, of examples of the types of evidence a registered entity may produce or may be asked to produce to demonstrate compliance with the Reliability Standard. A registered entity’s adherence to the examples contained within this RSAW does not necessarily constitute compliance with the applicable Reliability Standard, and NERC and the Regional Entity using this RSAW reserves the right to request additional evidence from the registered entity that is not included in this RSAW. Additionally, this RSAW includes excerpts from FERC Orders and other regulatory references. The FERC Order cites are provided for ease of reference only, and this document does not necessarily include all applicable Order provisions. In the event of a discrepancy between FERC Orders, and the language included in this document, FERC Orders shall prevail. [↑](#footnote-ref-1)
2. Compliance Assessment Date(s): The date(s) the actual compliance assessment (on-site audit, off-site spot check, etc.) occurs. [↑](#footnote-ref-2)
3. **2** Differences between the control mode tested and the final simulation model must be identified, particularly when analyzing

   load rejection data. Most controls change gains or have a set point runback which takes effect when the breaker opens. Load or

   set point controls will also not be in effect once the breaker opens. Some method of accounting for these differences must be

   presented if the final model is not validated from on-line data under the normal operating conditions under which the model is

   expected to apply.

   **3** Turbine/governor and load control or active power/frequency control:

   Turbine/governor and load control applies to conventional synchronous generation.

   Active power/frequency control applies to inverter connected generators (often found at variable energy plants). [↑](#footnote-ref-3)
4. If verification is performed, the 10 year period as outlined in MOD-027 Attachment 1 is reset. [↑](#footnote-ref-4)
5. Ibid. [↑](#footnote-ref-5)
6. Control replacement or alteration including software alterations or plant digital control system addition or replacement, plant digital control system software alterations that alter droop, and/or dead band, and/or frequency response and/or a change in the frequency control mode (such as going from droop control to constant MW control, etc.). [↑](#footnote-ref-6)