Unofficial Comment Form for 1st Draft of MOD-024-2 Verification and Data Reporting of Generator Real Power — Project 2007-09 Generator Verification

Please DO NOT use this form. Please use the electronic form located at the link below to submit comments on the proposed 1st draft of MOD-024-2 Verification and Data Reporting of Generator Real Power developed by the standard drafting team as part of Project 2007-09 – Generator Verification. Comments must be submitted by **February 18, 2010**. If you have questions please contact Harry Tom at Harry.Tom@nerc.net or by telephone at (860) 550-4157.

http://www.nerc.com/filez/standards/Generator-Verification-Project-2007-09.html

Background Information

The purpose of Project 2007-09 Generator Verification is:

- To ensure that generators will not trip off-line during specified voltage and frequency excursions or as a result of improper coordination between generator protective relays and generator voltage regulator controls and limit functions (such coordination will include the generating unit's capabilities).
- To ensure that generator models accurately reflect the generator's capabilities and operating characteristics.

The standard drafting team (SDT) for Project 2007-09 Generator Verification based its work on two existing NERC Board approved standards:

- MOD-024 — Verification of Generator Gross and Net Real Power Capability.
- MOD-025 — Verification of Generator Gross and Net Reactive Power Capability.

And four draft standards developed by the Phase III & IV SDT that were fielded tested by four Regions from mid 2006 through mid 2007.

- PRC-019 — Coordination of Generator Voltage Regulator Controls with Unit Capabilities and Protection
- PRC-024 — Generator Performance During Frequency and Voltage Excursions
- MOD-026 —Verification of Models and Data for Generator Excitation System Functions
- MOD-027 — Verification of Generator Unit Frequency Response

Before beginning the detailed work of developing the standards, the SDT was presented the recently completed field test results by the participants from the four field test Regions. The SDT also reviewed how and to what extent the two NERC Board approved standards were used across all the Regions. As a result of its initial review, the SDT decided that it was appropriate to develop each standard separately and not attempt to combine or merge any of the standards. The SDT felt that Generator Owners and Generator Operators could possibly perform some of the requirements of more than one standard at a time but most likely would not.

Since each standard will be standing on its own merit, the SDT has decided to post for comment the standards on an "as ready" basis.

MOD-024-2 Verification and Data Reporting of Generator Real Power was developed with consideration to key issues stated in the SAR:

- Provide more details to the applicability section
- Replace the "fill in the blanks" requirements assigned to the Regional Reliability Organization with a set of "continent-wide" requirements
- Assign responsibility to the appropriate functional entities as a result of updates to the functional model and the replacement of the requirements assigned to the Regional Reliability Organization

1. Consider and address issues identified in FERC orders, including the modifications to MOD-024-1 as proposed in FERC Order 693
2. Consider and address issues identified during Phase III & IV field testing

The SDT first considered the "applicability" using the guidance set forth in the Functional Model. Initially, the SDT thought that although the Generator Owner may be responsible for the verified values of a unit's capability, it is the Generator Operator that is the responsible entity to "operate" the unit in such a way as to obtain the required verification and any associated analysis – under the permission of the Generator Owner. The SDT felt that it is up to the Generator Owner and Generator Operator to work out any contractual arrangements associated with this relationship and not add requirements related to the Generator Owner providing approvals for the Generator Operator to perform such operations. After conferring with the Functional Model Working Group, the SDT was directed to change the applicability to Generator Owner based on roles and responsibilities assigned to the Generator Owner.

The SDT considered the extent of the facilities to be verified and how to reflect this in the "applicability". Approximately 4% of the system capacity is connected at a voltage less than 100kV. The SDT concluded that 4% was not an impact on reliability, and did not require verification of units connected below 100kV. The SDT has proposed that this standard be consistent with the more general Compliance Registry Guidelines.

The SDT determined that attempting to verify the MW output of variable energy units is not material to the reliability of the Bulk Electric System since use of this data in simulations would not be appropriate, only partial operation would be expected for planning studies, and they are therefore exempted from the requirements of this standard.

During its review of current practices related to verification, it was evident that many entities that use generator real power capability data depend more heavily on data submitted in accordance with other and, in some areas, verification associated with regional requirements and required by markets. The SDT found that system planners across the continent have different views on how detailed the verification needs to be and what is the appropriate duration of the verification. This results from the fact that system planning studies reflect different conditions, such as range of temperatures, type of generators, extent of uncertainty included in the study, value of current verification on longer term studies, etc. As a result the SDT decided that a regimented verification was not appropriate and would not provide the "value added". Instead the SDT has taken the approach that the Transmission Planner needs to communicate the conditions under which the Generator Owner is to provide verified values. The standard allows the Generator Owner to perform verification at any time during specific periods and use its experience and knowledge base of each unit to apply the appropriate adjustments to the verified values. This will help eliminate the need to run the unit through a potentially costly exercise to provide verified data that can be developed in a practical manner based on previous operation. This will also provide verified data consistent with the conditions the Transmission Planner expects to use them for.

In line with minimizing potentially unnecessary work by the Generator Owner and providing maximum benefit to the Transmission Planner, the SDT has developed a "diagram" guideline in the form of Attachment 1 to the standard. The Attachment can be used directly or modified as necessary to reflect the dozens of actual installation configurations. The Attachment sets the basic structure and data needed. The visual diagram provides for easier entry by the Generator Owner and application of information for Transmission Planner simulation models.

The following questions will assist the SDT in finalizing the development of MOD-024-2 Verification and Data Reporting of Generator Real Power. For questions where you agree with the SDT, please state that you agree and if available, please provide supporting documentation. If you disagree with the SDT, please explain why you disagree and provide data to support your position. To improve this first draft of MOD-024-2 Verification and Data Reporting of Generator Real Power, the SDT would appreciate responses to as many of these questions as you can answer.

1. MOD-024-1, Verification of Generator Gross and Net Real Power Capability, was approved by the NERC Board 2/7/2006. It has not been approved for enforcement under Section 215 by FERC because it contains "fill-in-the-blank" characteristics with responsibilities assigned to the Regional Reliability Organization. Megawatt data is currently collected and reported under several other standards as well as many market rules. Do you feel that there is a reliability need for this additional empirical data, or should this standard be retired? Please explain.

   ☒ Yes

   ☐ No

   Comments:
   Please review the possibility of redundancy within the following NERC standards:
   FAC-001-0;
   R1.1, Connection requirements for Generation facilities
   R2.1.3, Voltage level and MW and MVAR capacity or demand at point of connection.
   FAC-008-1;
   R1, GO shall each document its current methodology used for determining Facility Ratings…
   FAC-009-1;
   R1, GO shall each establish Facility ratings…
   MOD-010-0;
   R1, GOPs shall provide this steady-state modeling and simulation data…
   MOD-012-0;
   R1, GOPs shall provide appropriate equipment characteristics and system data…
   TOP-002-2a;
   R14, GOP shall notify the BA and TOP of changes in capabilities and characteristics…
   R14.1, Changes in real output capabilities

2. The SDT believes that verification should be performed on units that are connected down to 100 kV. The SDT believes this is consistent with the current Compliance Registry. The SDT has also provided how verification should be handled in plants/facilities that are greater than 75 MVA in aggregate gross nameplate rating. The Standard requires a separate

verification for every unit greater than 20 MVA gross nameplate rating and connected at the point of interconnection of 100 kV or above. The remaining units in a plant/facility can be verified separately or in aggregate as the Generator Owner chooses. Do you agree with the SDT's decision to have the Standard be applicable to facilities connected to 100 kV and above and verified as proposed? Please explain.

☒ Yes

☐ No

Comments:

3. After much discussion the SDT decided to require the verification be performed over a period of at least "one continuous hour" regardless of the type of unit because most units have reached steady state operation within one hour. Do you agree with this approach? If not, please explain.

☒ Yes

☐ No

Comments:

4. The SDT felt that units that cannot sustain continuous operation, oftentimes known as intermittent, variable or limited energy units, such as a Wind Generating Station or run-of-river hydro, etc., should be exempt from this standard because such units are typically represented in studies with "on average" or "discounted" values. Do you agree with this approach? If not, please explain.

☒ Yes

☐ No

Comments:

5. The SDT has developed a separate periodicity approach for identical units at the same site in Number 4.4 of Attachment 1. The Generator Owner would only be required to verify 20% of these units per year. Do you agree with this approach? If not, please explain.

☒ Yes

☐ No

Comments:

Please revise 4.4 of Attachment 1

4.4. Alternatively for multiple units installed at the same site where the units have identical designs, identical major components, identical significant control system settings and similar "tested" verified capabilities "per MOD-024":

4.4.1 Verify approximately 20 percent of all such units annually with all units being verified over a five year period.

4.4.2 Verify at least one unit each year if fewer than five units meet the criteria in 4.4.

6. The SDT believes that every Resource Planner and Planning Coordinator does not necessarily perform studies involving generating unit verified capability at the same time each year nor do they necessarily need current verified information at the same time. The SDT has developed Requirement R2 that requires the Resource Planner and Planning Coordinator to provide a schedule for receiving verified information that best fits the schedule and needs for performing studies. Do you agree with this approach? If not, please explain.

   ☒ Yes

   ☐ No

   Comments:

   R2 should be redacted to include variables and not be so constrained to temperature since there might be other variables besides temperature. These variables would be specified at the Planning Coordinator and Resource Planner discretion.

7. Are you aware of any regional variances that would be required for this standard?

   ☐ Yes

   ☒ No

   Comments:

8. Are you aware of any conflicts between the proposed standard and any regulatory function, rule, order, tariff, rate schedule, legislative requirement, or agreement?

   ☐ Yes

   ☒ No

   Comments:

9. Do you have any other questions or concerns with the proposed standard that have not been addressed? If yes, please provide a reference to the section, requirement or subrequirement that you believe should be changed, added or deleted and the rationale for your proposal.

   ☒ Yes

   ☐ No

   Comments: Requirement R1 – The requirement should be clarified that in the case of Joint-owned-units, the Operator of the unit is responsible for verifying the capability of the unit.

   For R1, R2, & R3, we propose a Violation Risk Factor of “Lower” and a Time Horizon of “Operations Planning, Long-Term Planning”. We propose “Lower” for the VRF because more accurate real power capability values will be assured by this requirement, but reasonably accurate values are likely without this requirement. We propose “Operations Planning, Long-Term Planning” for the TH because RCs and TOPs will use this data in their operations planning studies and PCs and TPs will use this data in their transmission planning studies.

   For R2, replace “desired temperature to which the data” with “desired ambient coolant temperature to which the summer and winter data” for added clarity.

In Attachment 1, 3.2; replace "ambient air temperature" with "ambient coolant (air, water, etc.) temperature" because the capability of different types of generators is affected by the temperature of different cooling medium. In addition, consideration may need to be given to the average pressure level of generating units that use hydrogen for equipment cooling.

Introduction, Section 4.2 - As written, small diesel generators at applicable Generating Facilities could be expected to be tested as part of this standard, even if these small generators are intended only for local site power, and are only capable of reaching a 100 KV interconnection by back-feeding through local site distribution circuits and auxiliary transformers. Based on the MVA metrics provided, it would appear their inclusion is not the intent, but the standard is ambiguous as written.

On the Implementation Plan for MOD-024-2 for units that are to be verified every five years, they state the verification "will begin five years after the compliance implementation date for annual units." Wouldn't it make more sense to make them verify in the first year after the MOD-24-02 is adopted or approved and then do it every five years after that?

On page 2 of 10, A.5. Effective Date, it seems unclear when they say verification "will begin 30 calendar days following the first summer or winter peak period" . For example, if the summer peak occurs in June and you expect a higher peak in July or August and it doesn't occur, then you would be in violation. The same applies for the winter period. They don't define the summer and winter period.

On page 5 of 10, MOD-024-2 Attachment 1. 2. Verify generating unit winter gross Real Power generating capability as follows: 2.1. They don't define the winter period and what the conditions should be for the verification test period. Please Clarify.

On page 5 of 10, MOD-024-2 Attachment 1. 2. Verify generating unit winter gross Real Power generating capability as follows: 2.4. "by making a temperature correction to the most recent summer gross Real Power generating capability verification." Under what conditions can temperature corrections be made?