

Standard Authorization Request Form

Title of Proposed Standard	Generator Verification (Project 2007-09)
Request Date	April 3, 2007

SAR Requestor Information	SAR Type <i>(Check a box for each one that applies.)</i>	
Name: Bob Millard	<input checked="" type="checkbox"/>	New Standards
Primary Contact: Bob Millard	<input checked="" type="checkbox"/>	Revision to existing Standards:
Telephone: (708) 588-9886 Fax:	<input type="checkbox"/>	Withdrawal of existing Standard
E-mail: bob.millard@rfirst.org	<input type="checkbox"/>	Urgent Action

<p>Purpose</p> <p>The purpose of Project 2007-09 Generator Verification is:</p> <ul style="list-style-type: none"> ▪ 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. <p>New standards to be finalized as part of this project are:</p> <ul style="list-style-type: none"> 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 <p>Standards to be revised as part of this project are:</p> <ul style="list-style-type: none"> MOD-024 — Verification of Generator Gross and Net Real Power Capability MOD-025 — Verification of Generator Gross and Net Reactive Power Capability
--

Industry Need

All six of the standards included in this project address generator verifications needed to support bulk power system reliability. All six of the standards included in this project were originally "Phase III & IV Planning Measures" that were translated into new or proposed standards as part of the Version 0 translation effort. Stakeholders have already agreed that there is a reliability-related need for each of these standards as part of the work performed in association with the Phase III & IV Modeling SAR. In addition, each of the standards included in this project has some "fill-in-the-blank" requirements assigned to the Regional Reliability Organization that need to be replaced with more specific "continent-wide" requirements before the standards are approved.

Specifically:

- MOD-024-1 and MOD-025-1 were approved by the NERC Board of Trustees but are "pending" with FERC because they include "fill-in-the-blank" requirements assigned to the Regional Reliability Organization (MOD-024-1 and MOD-025-1 require generator owners to verify the generator's gross and net real and reactive power capability using an RRO established procedure).

- PRC-019-1, PRC-024-1, MOD-026-1 and MOD-027-1 are draft standards that were developed under the Phase III & IV Modeling SAR that have not been presented to the NERC Board of Trustees yet. These four standards contain "fill-in-the-blank" requirements assigned to the Regional Reliability Organization (RRO) which were appropriate when the standards were initially drafted but are not appropriate under current requirements for approval of enforceable standards. Work on these standards to remove the "fill-in-the-blank" requirements under the Phase III & IV Modeling SAR is not authorized and therefore cannot be completed under the Phase III & IV Modeling SAR because the modifications needed to make the standards enforceable are outside the scope of the original Phase III & IV SARs. To properly complete these standards, a new SAR is needed and the prior SAR need to be terminated (termination of the Phase III & IV Modeling SAR will be performed outside the work of this SAR).
 - This set of standards includes verification of the generator's excitation system; verification of the generator's frequency response; verification that the generator can remain connected during specified voltage and frequency excursions; and verification that the generator's voltage regulator controls and limit functions have been coordinated with the generator's capabilities and protective relays.
 - The field test for this set of standards has shown that a standard can be written to support these verifications.

Brief Description

The scope of this project includes:

- modifying the six standards associated with this project so they conform to the latest version of NERC's Reliability Standards Development Procedure and the ERO Rules of Procedure,
- replacing the "fill-in-the-blank" requirements assigned to the Regional Reliability Organization with requirements that can be applied on a continent-wide basis and are assigned to users, owners or operators of the bulk power system, and
- considering and addressing issues identified in FERC orders, including the modifications to MOD-024-1 and MOD-025-1 as proposed in FERC Order 693.

Detailed Description

The standards drafting team (SDT) will bring the six standards into conformance with the latest version of NERC's Reliability Standards Development Procedure and the ERO Rules of Procedure. In addition, the STD will consider and address all applicable FERC Orders, including FERC Order 693, and the following proposed changes for each of the six standards in this set of standards:

Draft PRC-019-1

- Revise the purpose statement to include the reliability-related benefit of the standard
- Provide more details to the applicability section of the standard to identify any generator owners that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification that generator voltage regulator controls and limit functions are coordinated with the generator's capabilities and protective relays
- 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
- Add a 'violation risk factor' and a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

Draft PRC-024-1

- Provide more details to the applicability section of the standard to identify any generators that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification that generators will remain connected during specified system frequency and voltage excursions
- 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
- Add a requirement for the Transmission Owner and Generator Owner to coordinate protection systems
- Add a 'violation risk factor' and a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

MOD-024-1:

- Provide more details to the applicability section of the standard to identify any generators that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification of models and data associated with verification of generator gross and net real power capability
 - Consider requiring the generator owner to document the test conditions and the relationships between test conditions and generator output
- Assign responsibility to the appropriate functional entities as a result of updates to

Standards Authorization Request Form

the functional model and the replacement of the requirements assigned to the Regional Reliability Organization

- Add a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

MOD-025-1:

- Provide more details to the applicability section of the standard to identify any generators that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification of models and data associated with verification of generator gross and net Reactive Power capability
 - Consider requiring verification of reactive power capability at multiple points over a unit's operating range
- 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
- Add a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

Draft MOD-026-1

- Provide more details to the applicability section of the standard to identify any generators that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification of models and data associated with generator excitation system functions
- 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
- Add a 'violation risk factor' and a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

Draft MOD-027-1

- Revise the purpose statement to include the reliability-related benefit of the standard
- Provide more details to the applicability section of the standard to identify any generators that should be exempt from compliance with the requirements in the standard
- Replace the requirements assigned to the Regional Reliability Organization with a set of requirements that has more specificity and includes a set of 'continent-wide' criteria for verification of models and data associated with generator unit frequency response
- 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

Standards Authorization Request Form

Regional Reliability Organization

- Add a 'violation risk factor' and a 'time horizon' for each requirement
- Update all the compliance sections of the standard, including:
 - Update the compliance monitoring section to clarify that the regional entity will be the compliance monitor for the generator owner
 - Replace the 'levels of non-compliance' with 'violation severity levels'

Standards Authorization Request Form

Reliability Functions

The Standard Drafting Team will Consider Applicability to All Functional Entities (Check box for each one that may apply.)		
<input checked="" type="checkbox"/>	Reliability Coordinator	Responsible for the real-time operating reliability of its Reliability Coordinator Area in coordination with its neighboring Reliability Coordinator's wide area view.
<input type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within a Balancing Authority Area and supports Interconnection frequency in real time.
<input type="checkbox"/>	Interchange Coordinator	Ensures communication of interchange transactions for reliability evaluation purposes and coordinates implementation of valid and balanced interchange schedules between Balancing Authority Areas.
<input checked="" type="checkbox"/>	Planning Coordinator	Assesses the longer-term reliability of its Planning Coordinator Area.
<input type="checkbox"/>	Resource Planner	Develops a >one year plan for the resource adequacy of its specific loads within a Planning Coordinator area.
<input checked="" type="checkbox"/>	Transmission Planner	Develops a >one year plan for the reliability of the interconnected Bulk Electric System within its portion of the Planning Coordinator area.
<input type="checkbox"/>	Transmission Service Provider	Administers the transmission tariff and provides transmission services under applicable transmission service agreements (e.g., the pro forma tariff).
<input checked="" type="checkbox"/>	Transmission Owner	Owns and maintains transmission facilities.
<input checked="" type="checkbox"/>	Transmission Operator	Ensures the real-time operating reliability of the transmission assets within a Transmission Operator Area.
<input type="checkbox"/>	Distribution Provider	Delivers electrical energy to the End-use customer.
<input checked="" type="checkbox"/>	Generator Owner	Owns and maintains generation facilities.
<input type="checkbox"/>	Generator Operator	Operates generation unit(s) to provide real and reactive power.
<input type="checkbox"/>	Purchasing-Selling Entity	Purchases or sells energy, capacity, and necessary reliability-related services as required.
<input type="checkbox"/>	Market Operator	Interface point for reliability functions with commercial functions.
<input type="checkbox"/>	Load-Serving Entity	Secures energy and transmission service (and related reliability-related services) to serve the End-use Customer.

Standards Authorization Request Form

Reliability and Market Interface Principles

Applicable Reliability Principles <i>(Check box for all that apply.)</i>	
<input checked="" type="checkbox"/>	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input checked="" type="checkbox"/>	2. The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input checked="" type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input type="checkbox"/>	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
Does the proposed Standard comply with all of the following Market Interface Principles? <i>(Select 'yes' or 'no' from the drop-down box.)</i>	
1. A Reliability Standard shall not give any market participant an unfair competitive advantage. Yes	
2. A Reliability Standard shall neither mandate nor prohibit any specific market structure. Yes	
3. A Reliability Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
4. A Reliability Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

Standards Authorization Request Form

Related Standards

Standard No.	Explanation

Related SARs

SAR ID	Explanation
Phase III&IV Modeling	This SAR dated 11/17/04 initiated work on all six standards, two of which have been approved by the NERC BOT and four of which are still in draft phase, as referenced above above. The SDT working on the four draft standards will be terminated and undertaken by the new SDT for this SAR.

Regional Differences

Region	Explanation
ERCOT	
FRCC	
MRO	
NPCC	
SERC	
RFC	
SPP	
WECC	