

Violation Risk Factor and Violation Severity Level Assignments

Project 2007-09 Generator Verification

This document provides the drafting team's justification for assignment of violation risk factors (VRFs) and violation severity levels (VSLs) for each requirement in PRC-024-1 — [Generator Frequency and Voltage Protective Relay Settings](#) ~~Generator Performance During Frequency and Voltage Excursions~~.

Each primary requirement is assigned a VRF and a set of one or more VSLs. These elements support the determination of an initial value range for the Base Penalty Amount regarding violations of requirements in FERC-approved Reliability Standards, as defined in the ERO Sanction Guidelines.

Justification for Assignment of Violation Risk Factors

The Generator Verification Standard Drafting Team applied the following NERC criteria when proposing VRFs for the requirements under this project:

High Risk Requirement

A requirement that, if violated, could directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures; or, a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, or could hinder restoration to a normal condition.

Medium Risk Requirement

A requirement that, if violated, could directly affect the electrical state or the capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system. However, violation of a medium risk requirement is unlikely to lead to bulk electric system instability, separation, or cascading failures; or, a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly and adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. However, violation of a medium risk requirement is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to bulk electric system instability, separation, or cascading failures, nor to hinder restoration to a normal condition.

Lower Risk Requirement

A requirement that is administrative in nature and a requirement that, if violated, would not be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor and control the bulk electric system; or, a requirement that is administrative in nature and a requirement in a planning time frame that, if violated, would not, under the emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. A planning requirement that is administrative in nature.

The SDT also considered consistency with the FERC Violation Risk Factor Guidelines for setting VRFs:¹

Guideline (1) — Consistency with the Conclusions of the Final Blackout Report

The Commission seeks to ensure that Violation Risk Factors assigned to Requirements of Reliability Standards in these identified areas appropriately reflect their historical critical impact on the reliability of the Bulk-Power System.

In the VSL Order, FERC listed critical areas (from the Final Blackout Report) where violations could severely affect the reliability of the Bulk-Power System:²

- Emergency operations
- Vegetation management
- Operator personnel training
- Protection systems and their coordination
- Operating tools and backup facilities
- Reactive power and voltage control
- System modeling and data exchange
- Communication protocol and facilities
- Requirements to determine equipment ratings
- Synchronized data recorders
- Clearer criteria for operationally critical facilities
- Appropriate use of transmission loading relief

Guideline (2) — Consistency within a Reliability Standard

The Commission expects a rational connection between the sub-Requirement Violation Risk Factor assignments and the main Requirement Violation Risk Factor assignment.

Guideline (3) — Consistency among Reliability Standards

¹ North American Electric Reliability Corp., 119 FERC ¶ 61,145, order on reh'g and compliance filing, 120 FERC ¶ 61,145 (2007) (“VRF Rehearing Order”).

² Id. at footnote 15.

The Commission expects the assignment of Violation Risk Factors corresponding to Requirements that address similar reliability goals in different Reliability Standards would be treated comparably.

Guideline (4) — Consistency with NERC’s Definition of the Violation Risk Factor Level

Guideline (4) was developed to evaluate whether the assignment of a particular Violation Risk Factor level conforms to NERC’s definition of that risk level.

Guideline (5) — Treatment of Requirements that Co-mingle More Than One Obligation

Where a single Requirement co-mingles a higher risk reliability objective and a lesser risk reliability objective, the VRF assignment for such Requirements must not be watered down to reflect the lower risk level associated with the less important objective of the Reliability Standard.

The following discussion addresses how the SDT considered FERC’s VRF Guidelines 2 through 5. The team did not address Guideline 1 directly because of an apparent conflict between Guidelines 1 and 4. Whereas Guideline 1 identifies a list of topics that encompass nearly all topics within NERC’s Reliability Standards and implies that these requirements should be assigned a “High” VRF, Guideline 4 directs assignment of VRFs based on the impact of a specific requirement to the reliability of the system. The SDT believes that Guideline 4 is reflective of the intent of VRFs in the first instance and therefore concentrated its approach on the reliability impact of the requirements.

VRF for PRC-024-1:

There are ~~four five~~ requirements in PRC-024-1. Two of the Requirements (R1, and R2) were assigned a “Medium” VRF and the remaining ~~two three~~ requirements were assigned a “Lower” VRF.

VRF for PRC-024-1, Requirement R1:

- FERC Guideline 2 — Consistency within a Reliability Standard exists. Requirement R1 contains Parts specifying conditions for satisfying the main requirement. The VRFs are only applied at the Requirement level and each Requirement Part is treated equally. Requirement obligations include actions similar in scope to actions specified in Requirement R2 ~~and R5, both of~~ which were assigned a “Medium” VRF.
- FERC Guideline 3 — Consistency among Reliability Standards exists. This requirement is similar in concept with both PRC-012-0 Requirement R1 and PRC-023-1 Requirement R1, both of which require protection coordination or settings. These requirements apply to multiple elements while the requirements of PRC-024-1 apply to a single unit. Violation of this requirement by a single generator could not be construed as directly causing or contributing to BES instability, separation or cascading within any time frame. For a single violation to lead to BES instability, separation or cascading would require other standards requirements to be violated. This requirement is assigned a “Medium” VRF.

- FERC Guideline 4 — Consistency with NERC’s Definition of the VRF Level selected exists. Failure to ensure a proper frequency “no-trip” operating window is a requirement in the planning time frame that, if violated, is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to bulk electric system instability, separation, or cascading failures, nor to hinder restoration to a normal condition. ~~Therefore the assigned “Medium” VRF is appropriate.~~
- FERC Guideline 5 — Treatment of Requirements that Co-mingle More Than One Obligation is satisfactory. The Requirement R1 reliability objective is to ensure a proper frequency “no-trip” operating window. Requirement Parts are lower risk condition elements that establish main requirement criteria for completeness. The “Medium” VRF assigned is based on the reliability objective specified.

VRF for PRC-024-1, Requirement R2:

- FERC Guideline 2 — Consistency within a Reliability Standard exists. Requirement R2 contains Parts specifying conditions for satisfying the main requirement. The VRFs are only applied at the Requirement level and each Requirement Part is treated equally. Requirement obligations include actions similar in scope to actions specified in Requirement R1 ~~and R5, both of~~ which were assigned a “Medium” VRF.
- FERC Guideline 3 — Consistency among Reliability Standards exists. This requirement is similar in concept with both PRC-012-0 Requirement R1 and PRC-023-1 Requirement R1, both of which require protection coordination or settings. These requirements apply to multiple elements while the requirements of PRC-024-1 apply to a single unit. Violation of this requirement by a single generator could not be construed as directly causing or contributing to BES instability, separation or cascading within any time frame. For a single violation to lead to BES instability, separation or cascading would require other standards requirements to be violated. This requirement is assigned a “Medium” VRF.
- FERC Guideline 4 — Consistency with NERC’s Definition of the VRF Level selected exists. Failure to ensure proper voltage “no-trip” criteria is a requirement in the planning time frame that, if violated, is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to bulk electric system instability, separation, or cascading failures, nor to hinder restoration to a normal condition. Therefore the assigned “Medium” VRF is appropriate.
- FERC Guideline 5 — Treatment of Requirements that Co-mingle More Than One Obligation is satisfactory. The Requirement R2 reliability objective is to ensure proper voltage “no-trip” criteria. Requirement Parts are lower risk condition elements that establish main requirement criteria for completeness. The “Medium” VRF assigned is based on the reliability objective specified.

VRF for PRC-024-1, Requirements R3:

- FERC Guideline 2 — Consistency within a Reliability Standard exists. Requirement R3 contains Parts specifying response expectation and limitation reset conditions for satisfying the main requirement. The VRFs are only applied at the Requirement level and each Requirement Part is treated equally.
- FERC Guideline 3 — Consistency among Reliability Standards exists. This requirement is similar in concept with PRC-006-0 Requirement R1 which specifies documentation requirements. In addition, as is generally the case with reliability standard VRF definitions for documentation and administrative requirements, this requirement is assigned a “Lower” VRF.
- FERC Guideline 4 — Consistency with NERC’s Definition of the VRF Level selected exists. Failure to document limitations preventing compliance is a requirement that is administrative in nature for the planning time frame that, if violated, would not, under the emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. Therefore the assigned “Lower” VRF is appropriate.
- FERC Guideline 5 — Treatment of Requirements that Co-mingle More Than One Obligation is satisfactory. The Requirement R3 reliability objective is to document limitations preventing compliance. Requirement Parts and obligations are lower risk elements that ensure main requirement completeness which are administrative in nature consisting of response submission and limitation reset condition requirements. The “Lower” VRF assigned is based on the reliability objective specified.

~~VRF for PRC-024-1, Requirement R4:~~

- ~~• FERC Guideline 2 — Consistency within a Reliability Standard exists. Requirement R4 contains Parts that are procedural in nature defining criteria associated with the main requirement. The VRFs are only applied at the Requirement level and each Requirement Part is treated equally.~~
- ~~• FERC Guideline 3 — Consistency among Reliability Standards exists. This requirement requires an estimate of performance and is somewhat similar in concept with both PRC-009-0 Requirement R1 and PRC-014-0 Requirement R2, both of which reference protection analysis or assessment for determining adequacy. In addition, as is generally the case with reliability standard VRF definitions for analysis & assessment planning type requirements, this requirement is assigned a “Lower” VRF.~~
- ~~• FERC Guideline 4 — Consistency with NERC’s Definition of the VRF Level selected exists. Failure to estimate performance during a frequency or voltage excursion is a requirement that is administrative in nature for the planning time frame that, if violated, would not, under the~~

~~emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. Therefore the assigned “Lower” VRF is appropriate.~~

~~• FERC Guideline 5 — Treatment of Requirements that Co-mingle More Than One Obligation is satisfactory. The Requirement R4 reliability objective is to estimate performance during a frequency or voltage excursion. Requirement Parts and obligations are lower risk procedure based criteria for the main requirement. The “Lower” VRF assigned is based on the reliability objective specified.~~

VRF for PRC-024-1, Requirement R45:

- FERC Guideline 2 — Consistency within a Reliability Standard exists. Requirement R45 does not contain Parts. Requirement obligations specify the type of response and response time frame to be observed.
- FERC Guideline 3 — Consistency among Reliability Standards exists. This requirement is similar in concept with both PRC-007-0 Requirement R3 and PRC-010-0 Requirement R2, both of which require providing information within a specified time frame on request. In addition, as is generally the case with reliability standard VRF definitions for documentation and administrative requirements, this requirement is assigned a “Lower” VRF.
- FERC Guideline 4 — Consistency with NERC’s Definition of the VRF Level selected exists. Failure to provide setting and limitation information as requested is a requirement that is administrative in nature for the planning time frame that, if violated, would not, under the emergency, abnormal, or restorative conditions anticipated by the preparations, be expected to adversely affect the electrical state or capability of the bulk electric system, or the ability to effectively monitor, control, or restore the bulk electric system. Therefore the assigned “Lower” VRF is appropriate.
- FERC Guideline 5 — Treatment of Requirements that Co-mingle More Than One Obligation is satisfactory. The Requirement R45 reliability objective is to provide setting and limitation information as requested. Requirement obligations are lower risk condition elements administrative in nature for ensuring the main requirement is satisfied in a timely manner. The “Lower” VRF assigned is based on the reliability objective specified.

Justification for Assignment of Violation Severity Levels:

In developing the VSLs for the standards under this project, the SDT anticipated the evidence that would be reviewed during an audit, and developed its VSLs based on the noncompliance an auditor may find during a typical audit. The SDT based its assignment of VSLs on the following NERC criteria:

Lower	Moderate	High	Severe
<p>Missing a minor element (or a small percentage) of the required performance. The performance or product measured has significant value as it almost meets the full intent of the requirement.</p>	<p>Missing at least one significant element (or a moderate percentage) of the required performance. The performance or product measured still has significant value in meeting the intent of the requirement.</p>	<p>Missing more than one significant element (or is missing a high percentage) of the required performance or is missing a single vital component. The performance or product has limited value in meeting the intent of the requirement.</p>	<p>Missing most or all of the significant elements (or a significant percentage) of the required performance. The performance measured does not meet the intent of the requirement or the product delivered cannot be used in meeting the intent of the requirement.</p>

FERC’s VSL guidelines are presented below, followed by an analysis of whether the VSLs proposed for each requirement in PRC-024-1 meet the FERC Guidelines for assessing VSLs:

Guideline 1: Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance

Compare the VSLs to any prior levels of non-compliance and avoid significant changes that may encourage a lower level of compliance than was required when levels of non-compliance were used.

Guideline 2: Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties

A violation of a “binary” type requirement must be a “Severe” VSL.

Do not use ambiguous terms such as “minor” and “significant” to describe noncompliant performance.

Guideline 3: Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement

VSLs should not expand on what is required in the requirement.

Guideline 4: Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations

. . . unless otherwise stated in the requirement, each instance of non-compliance with a requirement is a separate violation. Section 4 of the Sanction Guidelines states that assessing penalties on a per violation per day basis is the “default” for penalty calculations.

VSLs for PRC-024-1 Requirement R1:

R#	Compliance with NERC VSL Guidelines	Guideline 1 Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance	Guideline 2 Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties Guideline 2a: The Single Violation Severity Level Assignment Category for "Binary" Requirements Is Not Consistent Guideline 2b: Violation Severity Level Assignments that Contain Ambiguous Language	Guideline 3 Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement	Guideline 4 Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations
R1.	The NERC VSL guidelines are satisfied by incorporating binary VSL elements.	This is a new Requirement and does not have a prior level of compliance.	Proposed VSL's are a combination of binary elements and are categorized as severe. Proposed VSL language does not include ambiguous terms and ensure uniformity and consistency in the determination of penalties based on binary performance, and timeliness of the actions and obligations	Proposed VSL's do not expand on what is required in the requirement. The VSL's assigned only consider performing required action per the conditions specified by listed parts. Proposed VSL's are consistent with the requirement.	Proposed VSL's are based on a single violation and not a cumulative violation methodology.

VSLs for PRC-024-1 Requirement R2:

R#	Compliance with NERC VSL Guidelines	Guideline 1 Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance	Guideline 2 Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties Guideline 2a: The Single Violation Severity Level Assignment Category for "Binary" Requirements Is Not Consistent Guideline 2b: Violation Severity Level Assignments that Contain Ambiguous Language	Guideline 3 Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement	Guideline 4 Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations
R2.	The NERC VSL guidelines are satisfied by incorporating binary VSL elements.	This is a new Requirement and does not have a prior level of compliance.	Proposed VSL's are a combination of binary elements and are categorized as severe. Proposed VSL language does not include ambiguous terms and ensure uniformity and consistency in the determination of penalties based on binary performance, and timeliness of the actions and obligations specified.	Proposed VSL's do not expand on what is required in the requirement. The VSL's assigned only consider performing required action per the conditions specified by listed parts. Proposed VSL's are consistent with the requirement.	Proposed VSL's are based on a single violation and not a cumulative violation methodology.

VSLs for PRC-024-1 Requirement R3:

R#	Compliance with NERC VSL Guidelines	Guideline 1 Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance	Guideline 2 Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties Guideline 2a: The Single Violation Severity Level Assignment Category for "Binary" Requirements Is Not Consistent Guideline 2b: Violation Severity Level Assignments that Contain Ambiguous Language	Guideline 3 Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement	Guideline 4 Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations
R3.	The NERC VSL guidelines are satisfied by incorporating increments for tardiness elements.	This is a new Requirement and does not have a prior level of compliance.	Proposed VSL's incorporate the increments for tardiness methodology. Proposed VSL language does not include ambiguous terms and ensure uniformity and consistency in the determination of penalties based on timeliness of the action specified.	Proposed VSL's do not expand on what is required in the requirement. The VSL's assigned only consider performing required action in a timely manner including response obligation and reset conditions specified by listed parts. Proposed VSL's are consistent with the requirement.	Proposed VSL's are based on a single violation and not a cumulative violation methodology.

VSLs for PRC-024-1 Requirement R4:

R#	Compliance with NERC VSL Guidelines	Guideline-1 Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance	Guideline-2 Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties Guideline-2a- The Single Violation Severity Level Assignment Category for "Binary" Requirements Is Not Consistent Guideline-2b- Violation Severity Level Assignments that Contain Ambiguous Language	Guideline-3 Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement	Guideline-4 Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations
R4:	The NERC VSL guidelines are satisfied by incorporating increments for tardiness.	This is a new Requirement and does not have a prior level of compliance.	Proposed VSL's reflect increments for tardiness. Proposed VSL language does not include ambiguous terms and ensure uniformity and consistency in the determination of penalties based on binary performance, and both completeness and timeliness of the actions and obligations specified.	Proposed VSL's do not expand on what is required in the requirement. The VSL's assigned only consider performing required action in a timely manner per the procedure criteria specified by listed parts. Proposed VSL's are consistent with the requirement.	Proposed VSL's are based on a single violation and not a cumulative violation methodology.

VSLs for PRC-024-1 Requirement R45:

R#	Compliance with NERC VSL Guidelines	Guideline 1 Violation Severity Level Assignments Should Not Have the Unintended Consequence of Lowering the Current Level of Compliance	Guideline 2 Violation Severity Level Assignments Should Ensure Uniformity and Consistency in the Determination of Penalties Guideline 2a: The Single Violation Severity Level Assignment Category for "Binary" Requirements Is Not Consistent Guideline 2b: Violation Severity Level Assignments that Contain Ambiguous Language	Guideline 3 Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement	Guideline 4 Violation Severity Level Assignment Should Be Based on A Single Violation, Not on A Cumulative Number of Violations
R46.	The NERC VSL guidelines are satisfied by incorporating increments for tardiness elements.	This is a new Requirement and does not have a prior level of compliance.	Proposed VSL's incorporate the increments for tardiness methodology. Proposed VSL language does not include ambiguous terms and ensure uniformity and consistency in the determination of penalties based on timeliness of the action specified.	Proposed VSL's do not expand on what is required in the requirement. The VSL's assigned only consider performing required action in a timely manner. Proposed VSL's are consistent with the requirement.	Proposed VSL's are based on a single violation and not a cumulative violation methodology.