

Standard Authorization Request Form

Title of Proposed Standard: (Project 2008-02) PRC-010-0 — Assessment of the Design and Effectiveness of UVLS Program PRC-022-1 — Under-Voltage Load Shedding Program Performance	
Request Date	January 11, 2010
SC Approval Date	January 151, 2010

SAR Requester Information	SAR Type <i>(Check a box for each one that applies.)</i>
Name: TBD	<input type="checkbox"/> New Standard
Primary Contact Stephen Crutchfield NERC Staff	<input checked="" type="checkbox"/> Revision to existing Standard 1. PRC-010-0 — Technical Assessment of the Design and Effectiveness of Undervoltage Load Shedding Program PRC-022-1 — Undervoltage Load Shedding Program Performance TPL-001 through TPL-004 as appropriate.
Telephone 609-651-9455 Fax	<input type="checkbox"/> Withdrawal of existing Standard
E-mail Stephen.crutchfield@nerc.net	<input type="checkbox"/> Urgent Action

<p>Purpose</p> <p>To improve the existing standards on Under Voltage Load Shedding (UVLS) to include criteria for Under Voltage Load Shedding programs such that the programs work as intended to shed load when needed and prevent voltage collapse and voltage instability in the Bulk Electric System.</p>
<p>Industry Need</p> <p>Load characteristics have changed drastically over the last few years and FIDVR events have become increasingly more probable with the increased penetration of low-inertia air conditioner loads that lack compressor undervoltage protection. Protection and controls impacts on FIDVR events abound. Requirements are needed for FIDVR studies that include protection and controls actions and potential misoperations.</p> <p>Two 2003 Blackout recommendations¹ 8b and 13c relating to UVLS need to be considered in the standard development process.</p>

¹ From the report, "August 14, 2003 Blackout: NERC Actions to Prevent and Mitigate the Impacts of Future Cascading Blackouts February 10, 2004"

Recommendation 8b: Each regional reliability council shall complete an evaluation of the feasibility and benefits of installing under-voltage load shedding capability in load centers within the region that could become unstable as a result of being deficient in reactive power following credible multiple-contingency events. The regions are to complete the initial studies and report the results to NERC within one year. The regions are requested to promote the installation of under-voltage load shedding capabilities within critical areas, as determined by the studies to be effective in preventing an uncontrolled cascade of the power system.

Recommendation 13c: The Planning Committee, working in conjunction with the regional reliability councils, shall within two years reevaluate the criteria, methods and practices used for system design, planning and analysis; and shall report the results and recommendations to the NERC board. This review shall include an evaluation of transmission facility ratings methods and practices, and the sharing of consistent ratings information.

Technical studies addressing FIDVR and the two blackout recommendations, as well as an evaluation of the existing standards have been prepared by various NERC technical committees and identify areas where the existing standards need improvement to prevent voltage collapse and voltage instability through UVLS programs.

Brief Description

There are two standards to be revised under this SAR:

- PRC-010-0 — “Assessment of the Design and Effectiveness of UVLS Program” specifies requirements for the responsible entity to periodically conduct and document an assessment of the effectiveness of the UVLS program.
- PRC-022-1 — “Under-Voltage Load Shedding Program Performance” specifies requirements for responsible entities to analyze and document operation and misoperation of UVLS systems.

These standards should be consolidated, and specific criteria for UVLS programs and assessments of those UVLS programs should be added; “fill-in-the-blank” elements should be eliminated; the issues identified by stakeholders and FERC in Attachment 1 should be addressed; and the concepts in the following papers should be addressed:

“Fault-Induced Delayed Voltage Recovery”

“Guidelines for Developing an Under Voltage Load Shedding (UVLS) Evaluation Program”

“Evaluation of Criteria, Methods, and Practices used for System Design, Planning, and Analysis in Response to NERC Blackout Recommendation 13c”

“NERC SPCTF Technical Review of PRC-010-0 — Assessment of the Design and Effectiveness of UVLS Program”

The development may include other improvements to the standards deemed appropriate by the drafting team, with the consensus of stakeholders, consistent with establishing high quality, enforceable and technically sufficient bulk power system reliability standards.

The standard drafting team will also modify the standards to conform to the latest version of NERC’s Reliability Standards Development Procedure, the NERC Standard Drafting Team Guidelines, and the ERO Rules of Procedure as described in the “Global Improvements” section of Volume I of the Reliability Standards Development Plan and included in this SAR as Attachment 2.

Detailed Description

PRC-010-0 —Assessment of the Design and Effectiveness of UVLS Program and PRC-022-1 —Under-Voltage Load Shedding Program Performance should be consolidated, and specific criteria for UVLS programs and assessments of those UVLS programs should be added; “fill-in-the-blank” elements should be eliminated; the issues identified by stakeholders and FERC in Attachment 1 should be addressed; and the concepts in the following papers should be addressed:

“Fault-Induced Delayed Voltage Recovery” was developed jointly by the Transmission Issues Subcommittee and the System Protection and Control Subcommittee. The report identifies a Fault Induced Delayed Voltage Recovery (FIDVR) as the phenomenon whereby system voltage remains at significantly reduced levels for several seconds after a transmission, sub transmission, or distribution fault has been cleared. Significant load loss due to motor protective device action can result, as can significant loss of generation, with a potential secondary effect of high system voltage due to load loss. A severe event can result in fast voltage collapse.

“Guidelines for Developing an Under Voltage Load Shedding (UVLS) Evaluation Program” was prepared by the Transmission Issues Subcommittee related to NERC blackout recommendation 8b (dated September 13, 2006).

Recommendation 8b: Each regional reliability council shall complete an evaluation of the feasibility and benefits of installing under-voltage load shedding capability in load centers within the region that could become unstable as a result of being deficient in reactive power following credible multiple-contingency events. The regions are to complete the initial studies and report the results to NERC within one year. The regions are requested to promote the installation of under-voltage load shedding capabilities within critical areas, as determined by the studies to be effective in preventing an uncontrolled cascade of the power system.

“Evaluation of Criteria, Methods, and Practices used for System Design, Planning, and Analysis in Response to NERC Blackout Recommendation 13c” was prepared by the Transmission Issues Subcommittee of the NERC Planning Committee to address recommendation 13c (Draft Dated February 22, 2006). Section III.2 - Use of Undervoltage Load Shed (UVLS) Schemes identifies the need for greater consistency in the criteria for applying UVLS.

Recommendation 13c: The Planning Committee, working in conjunction with the regional reliability councils, shall within two years reevaluate the criteria, methods and practices used for system design, planning and analysis; and shall report the results and recommendations to the NERC board. This review shall include an evaluation of transmission facility ratings methods and practices, and the sharing of consistent ratings information.

“NERC SPCTF Technical Review of PRC-010-0 — Assessment of the Design and Effectiveness of UVLS Program” was prepared by the System Protection and Controls Task Force of the NERC Planning Committee (dated May 17, 2007) identifies the need to expand the scope of the standards’ applicability to include generator owners and improved coordination with generator station under voltage protection as well as improved coordination with other protection systems.

The development may include other improvements to the standards deemed appropriate by the drafting team, with the consensus of stakeholders, consistent with establishing high quality, enforceable and technically sufficient bulk power system reliability standards.

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Reliability Functions

The Standard will Apply to the Following Functions <i>(Check box for each one that applies.)</i>		
<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 Authority	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 checked="" type="checkbox"/>	Distribution Provider	Delivers electrical energy to the End-use customer.
<input checked="" type="checkbox"/>	Generator Owner	Owns and maintains generation facilities.
<input checked="" 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 reliability-related services) to serve the End-use Customer.

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Reliability and Market Interface Principles

Applicable Reliability Principles <i>(Check box for all that apply.)</i>	
<input checked="" type="checkbox"/>	1. Interconnected bulk power 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 power 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 power systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input checked="" type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained and implemented.
<input checked="" type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk power systems.
<input checked="" type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The security of the interconnected bulk power systems shall be assessed, monitored and maintained on a wide area basis.
<input type="checkbox"/>	8. Bulk power systems shall be protected from malicious physical or cyber attacks.
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	

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Related Standards

Standard No.	Explanation
TPL-001-1	See SPCTF Report

Related SARs

SAR ID	Explanation
Project 2008-01	The two projects will require "monitoring" to see if coordination is required.
Project 2007-06	The two projects will require "monitoring" to see if coordination is required between the revised standards and PRC-001

Regional Variances

Region	Explanation
ERCOT	
FRCC	
MRO	
NPCC	
SERC	
RFC	
SPP	
WECC	

Attachment 1 — FERC Order 693 Directives and Stakeholder Issues

Source	Language
Other	Modify standard to conform to the latest version of NERC's Reliability Standards Development Procedure, the NERC Standard Drafting Team Guidelines, and the ERO Rules of Procedure
PRC-010-0 — Technical Assessment of the Design and Effectiveness of Undervoltage Load Shedding Program	
FERC Order 693	Require that an integrated and coordinated approach be included in all protection systems on the bulk power system, including generators and transmission lines, generators' low-voltage ride-through capabilities, and UFLS and UVLS systems. Paragraph 1509. We appreciate MEAG's feedback to our response in the NOPR. For the reasons discussed in the NOPR, as well as our explanation above, the Commission approves Reliability Standard PRC-010-0 as mandatory and enforceable. In addition, the Commission directs the ERO to develop a modification to PRC-010-0 through the Reliability Standards development process that requires that an integrated and coordinated approach be included in all protection systems on the Bulk-Power System, including generators and transmission lines, generators' low voltage ride-through capabilities, and UFLS and UVLS programs.
FERC's December 20, 2007 Order in Docket Nos. RC07-004-000, RC07-6-000, and RC07-7-000	<p>In FERC's December 20, 2007 Order, the Commission reversed NERC's Compliance Registry decisions with respect to three load serving entities in the ReliabilityFirst (RFC) footprint. The distinguishing feature of these three LSEs is that none own physical assets. Both NERC and RFC assert that there will be a "reliability gap" if retail marketers are not registered as LSEs. To avoid a possible gap, a consistent, uniform approach to ensure that appropriate Reliability Standards and associated requirements are applied to retail marketers must be followed. Each drafting team responsible for reliability standards that are applicable to LSEs is to review and change as necessary, requirements in the reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers. For additional information see:</p> <ul style="list-style-type: none"> • FERC's December 20, 2007 Order (http://www.nerc.com/files/LSE_decision_order.pdf) • NERC's March 4, 2008 (http://www.nerc.com/files/FinalFiledLSE3408.pdf), • FERC's April 4, 2008 Order (http://www.nerc.com/files/AcceptLSECompFiling-040408.pdf), and • NERC's July 31, 2008 (http://www.nerc.com/files/FinalFiled-CompFiling-LSE-07312008.pdf) compliance filings to FERC on this subject.
Fill in the Blank Team	Placeholder
Phase III/IV Team	<ul style="list-style-type: none"> • PRC-010 is a very weak standard — it only requires documentation and, in very broad terms, 'coordination' — it doesn't specify any level of desired performance or any specific scope for coordination. There should be some details to identify what the coordination must achieve — such as verification that the UVLS will trip when voltage drops to a specified voltage and verification that only a specified amount of load will be tripped and that other special protection systems will not be activated by the UVLS program. • There is no requirement that identifies the desired performance of a UVLS program (what voltage set points and timing are acceptable?). • What is the reliability-related need for the RRO to collect data on misoperations and operations of UVLS programs? Is this information used for anything?
Team Comments	Provide clarity where the Planning Authority is mentioned

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Source	Language
Version 0 Team	<ul style="list-style-type: none"> • Define evidence • Exemptions for some who use shunt reactors • Level 4 vs. level 1 changes
PRC-022-1 — Under-Voltage Load Shedding Program Performance	
FERC's December 20, 2007 Order in Docket Nos. RC07-004-000, RC07-6-000, and RC07-7-000	<p>In FERC's December 20, 2007 Order, the Commission reversed NERC's Compliance Registry decisions with respect to three load serving entities in the ReliabilityFirst (RFC) footprint. The distinguishing feature of these three LSEs is that none own physical assets. Both NERC and RFC assert that there will be a "reliability gap" if retail marketers are not registered as LSEs. To avoid a possible gap, a consistent, uniform approach to ensure that appropriate Reliability Standards and associated requirements are applied to retail marketers must be followed. Each drafting team responsible for reliability standards that are applicable to LSEs is to review and change as necessary, requirements in the reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers. For additional information see:</p> <ul style="list-style-type: none"> • FERC's December 20, 2007 Order (http://www.nerc.com/files/LSE_decision_order.pdf) • NERC's March 4, 2008 (http://www.nerc.com/files/FinalFiledLSE3408.pdf), • FERC's April 4, 2008 Order (http://www.nerc.com/files/AcceptLSECompFiling-040408.pdf), and • NERC's July 31, 2008 (http://www.nerc.com/files/FinalFiled-CompFiling-LSE-07312008.pdf) compliance filings to FERC on this subject.
FERC Order 693	<p>Consider FirstEnergy's suggestions to revise requirement R1.3 as part of the standards development process. Paragraph 1564. FirstEnergy comments that Requirement R1.3 requires "a simulation of the event, if deemed appropriate by the RRO" and believes that the applicable entities such as transmission operators may not be able to simulate large system events. FirstEnergy suggests that Requirement R1.3 be revised to state that "a simulation of the event, if deemed appropriate, and assisted by the [regional reliability organization]."</p>
Phase III/IV Team	<ul style="list-style-type: none"> • Consider incorporating into this family of standards a requirement that each TO should study, and implement if found effective, a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES. • The reliability-related need for the RRO to collect data on operations and misoperations isn't clear — should this be revised and made available instead to the Compliance Monitor or to the Planning Authority? • The TO should also be required to demonstrate that its UVLS program is coordinated with adjacent TOs.

Issues to be Considered by Drafting Team Project 2008-02 — Undervoltage Load Shedding	
Standard #	Title
PRC-022-1	Under-Voltage Load Shedding Program Performance
Issues	<p>FERC Order 693</p> <p>Disposition: Approved.</p> <p>Consider FirstEnergy’s suggestions to revise requirement R1.3 as part of the standards development process. {Paragraph 1564. FirstEnergy comments that Requirement R1.3 requires “a simulation of the event, if deemed appropriate by the RRO” and believes that the applicable entities such as transmission operators may not be able to simulate large system events. FirstEnergy suggests that Requirement R1.3 be revised to state that “a simulation of the event, if deemed appropriate, and assisted by the [regional reliability organization].”}</p> <p>Phase III/IV comments</p> <ul style="list-style-type: none"> • Consider incorporating into this family of standards a requirement that each TO should study, and implement if found effective, a UVLS program to mitigate the risk of voltage collapse or voltage instability in the BES. • The TO should also be required to demonstrate that its UVLS program is coordinated with adjacent TOs. • The reliability-related need for the RRO to collect data on operations and misoperations isn’t clear – should this be revised and made available instead to the Compliance Monitor or to the Planning Authority? <p>Other</p> <ul style="list-style-type: none"> • Modify standard to conform to the latest version of NERC’s Reliability Standards Development Procedure, the NERC Standard Drafting Team Guidelines, and the ERO Rules of Procedure. <p>FERC’s December 20, 2007 and April 4, 2008 Orders in Docket Nos. RC07-004-000, RC07-6-000, and RC07-7-000</p> <ul style="list-style-type: none"> • In FERC’s December 20, 2007 Order, the Commission reversed NERC’s Compliance Registry decisions with respect to three load serving entities in the ReliabilityFirst (RFC) footprint. The distinguishing feature of these three LSEs is that none owned physical assets. Both NERC and RFC assert that there will be a “reliability gap” if retail marketers are not registered as LSEs. To avoid a possible gap, a consistent, uniform approach to ensure that appropriate Reliability Standards and associated requirements are applied to retail marketers must be applied. Each drafting team responsible for reliability standards applicable to LSEs is to review and change as necessary, requirements in the applicable reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers. For additional information see: <ul style="list-style-type: none"> • FERC’s December 20, 2007 Order (http://www.nerc.com/files/LSE_decision_order.pdf) • NERC’s March 4, 2008 (http://www.nerc.com/files/FinalFiledLSE3408.pdf), • FERC’s April 4, 2008 Order (http://www.nerc.com/files/AcceptLSECompFiling-040408.pdf) and • NERC’s July 31, 2008 (http://www.nerc.com/files/FinalFiled-CompFiling-LSE-07312008.pdf) compliance filings to FERC on this subject.

Attachment 2 – Global Improvements

Global Improvements

The standard drafting team for each of the projects identified in this plan is expected to review the assigned standards and modify the standards to conform to the latest version of NERC's Reliability Standards Development Procedure, the NERC Standard Drafting Team Guidelines, and the ERO Rules of Procedure as described in this "Global Improvements" section.

Statutory Criteria

In accordance with Section 215 of the Federal Power Act, FERC may approve, by rule or order, a proposed reliability standard or modification to a reliability standard if it determines that "the standard is just, reasonable, not unduly discriminatory or preferential, and in the public interest."

The first three of these criteria can be addressed in large part by the diligent adherence to NERC's *Reliability Standards Development Procedure*, which has been certified by the ANSI as being open, inclusive, balanced, and fair. Users, owners, and operators of the bulk power system that must comply with the standards, as well as the end-users who benefit from a reliable supply of electricity and the public in general, gain some assurance that standards are just, reasonable, and not unduly discriminatory or preferential because the standards are developed through an ANSI-accredited procedure.

The remaining portion of the statutory test is whether the standard is "in the public interest." Implicit in the public-interest test is that a standard is technically sound and ensures a level of reliability that should be reasonably expected by end-users of electricity. Additionally, each standard must be clearly written, so that bulk power system users, owners, and operators are put on notice of the expected behavior. Ultimately, the standards should be defensible in the event of a governmental authority review or court action that may result from enforcing the standard and applying a financial penalty.

The standards must collectively provide a comprehensive and complete set of technically sound requirements that establish an acceptable threshold of performance necessary to ensure the reliability of the bulk power system. "An adequate level of reliability" would argue for both a complete set of standards addressing all aspects of bulk power system design, planning, and operation that materially affect reliability, and for the technical efficacy of each standard. The Commission directed NERC to define the term, "adequate level of reliability" as part of its January 18, 2007 Order on Compliance Filing. Accordingly, NERC's Operating and Planning Committees prepared the definition and the NERC Board approved it at its February 2008 meeting for filing with regulatory authorities. The NERC Standards Committee was then tasked to integrate the definition into the development of future reliability standards.

Quality Objectives

To achieve the goals outlined above, NERC has developed 10 quality objectives for the development of reliability standards. Drafting teams working on assigned projects are charged to ensure their work adheres to the following quality objectives:

- 1. Applicability** — Each reliability standard shall clearly identify the functional classes of entities responsible for complying with the reliability standard, with any specific additions or exceptions noted. Such functional classes² include: ERO, Regional Entities, reliability coordinators, balancing authorities, transmission operators, transmission owners, generator operators, generator owners, interchange authorities, transmission service providers, market operators, planning coordinators, transmission planners, resource planners, load-serving entities, purchasing-selling entities, and distribution providers. Each reliability standard that does not apply to the entire North American bulk power system shall also identify the geographic applicability of the standard, such as an interconnection, or within a regional entity area. The applicability section of the standard should also include any limitations on the applicability of the standard based on electric facility characteristics, such as a requirement that applies only to the subset of distribution providers that own or operate underfrequency load shedding systems.
- 2. Purpose** — Each reliability standard shall have a clear statement of purpose that shall describe how the standard contributes to the reliability of the bulk power system.
- 3. Performance Requirements** — Each reliability standard shall state one or more performance requirements, which if achieved by the applicable entities, will provide for a reliable bulk power system, consistent with good utility practices and the public interest. Each requirement is not a “lowest common denominator” compromise, but instead achieves an objective that is the best approach for bulk power system reliability, taking account of the costs and benefits of implementing the proposal.
- 4. Measurability** — Each performance requirement shall be stated so as to be objectively measurable by a third party with knowledge or expertise in the area addressed by that requirement. Each performance requirement shall have one or more associated measures used to objectively evaluate compliance with the requirement. If performance results can be practically measured quantitatively, metrics shall be provided within the requirement to indicate satisfactory performance.
- 5. Technical Basis in Engineering and Operations** — Each reliability standard shall be based upon sound engineering and operating judgment, analysis, or experience, as determined by expert practitioners in that particular field.
- 6. Completeness** — Each reliability standard shall be complete and self-contained. The standards shall not depend on external information to determine the required level of performance.
- 7. Consequences for Noncompliance** — Each reliability standard shall make clearly known to the responsible entities the consequences of violating a standard, in combination with guidelines for penalties and sanctions, as well as other ERO and Regional Entity compliance documents.
- 8. Clear Language** — Each reliability standard shall be stated using clear and unambiguous language. Responsible entities, using reasonable judgment and in keeping with good utility practices, are able to arrive at a consistent interpretation of the required performance.

² These functional classes of entities are derived from NERC’s Reliability Functional Model. When a standard identifies a class of entities to which it applies, that class must be defined in the Glossary of Terms Used in Reliability Standards.

- 9. Practicality** — Each reliability standard shall establish requirements that can be practically implemented by the assigned responsible entities within the specified effective date and thereafter.
- 10. Consistent Terminology** — Each reliability standard, to the extent possible, shall use a set of standard terms and definitions that are approved through the NERC Reliability Standards Development Process.

In addition to these factors, standard drafting teams also contemplate the following factors the Commission uses to approve a proposed reliability standard as outlined in Order No. 672. A standard proposed to be approved:

1. Must be designed to achieve a specified reliability goal

“321. The proposed Reliability Standard must address a reliability concern that falls within the requirements of section 215 of the FPA. That is, it must provide for the reliable operation of bulk power system facilities. It may not extend beyond reliable operation of such facilities or apply to other facilities. Such facilities include all those necessary for operating an interconnected electric energy transmission network, or any portion of that network, including control systems. The proposed Reliability Standard may apply to any design of planned additions or modifications of such facilities that is necessary to provide for reliable operation. It may also apply to cyber security protection.”

“324. The proposed Reliability Standard must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve this goal. Although any person may propose a topic for a Reliability Standard to the ERO, in the ERO’s process, the specific proposed Reliability Standard should be developed initially by persons within the electric power industry and community with a high level of technical expertise and be based on sound technical and engineering criteria. It should be based on actual data and lessons learned from past operating incidents, where appropriate. The process for ERO approval of a proposed Reliability Standard should be fair and open to all interested persons.”

2. Must contain a technically sound method to achieve the goal

“324. The proposed Reliability Standard must be designed to achieve a specified reliability goal and must contain a technically sound means to achieve this goal.

Although any person may propose a topic for a Reliability Standard to the ERO, in the ERO’s process, the specific proposed Reliability Standard should be developed initially by persons within the electric power industry and community with a high level of technical expertise and be based on sound technical and engineering criteria. It should be based on actual data and lessons learned from past operating incidents, where appropriate. The process for ERO approval of a proposed Reliability Standard should be fair and open to all interested persons.”

3. Must be applicable to users, owners, and operators of the bulk power system, and not others

“322. The proposed Reliability Standard may impose a requirement on any user, owner, or operator of such facilities, but not on others.”

- 4. Must be clear and unambiguous as to what is required and who is required to comply**
“325. The proposed Reliability Standard should be clear and unambiguous regarding what is required and who is required to comply. Users, owners, and operators of the Bulk-Power System must know what they are required to do to maintain reliability.”
- 5. Must include clear and understandable consequences and a range of penalties (monetary and/or non-monetary) for a violation**
“326. The possible consequences, including range of possible penalties, for violating a proposed Reliability Standard should be clear and understandable by those who must comply.”
- 6. Must identify clear and objective criterion or measure for compliance, so that it can be enforced in a consistent and non-preferential manner**
“327. There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner.”
- 7. Should achieve a reliability goal effectively and efficiently - but does not necessarily have to reflect “best practices” without regard to implementation cost**
“328. The proposed Reliability Standard does not necessarily have to reflect the optimal method, or “best practice,” for achieving its reliability goal without regard to implementation cost or historical regional infrastructure design. It should however achieve its reliability goal effectively and efficiently.”
- 8. Cannot be “lowest common denominator,” i.e., cannot reflect a compromise that does not adequately protect bulk power system reliability**
“329. The proposed Reliability Standard must not simply reflect a compromise in the ERO’s Reliability Standard development process based on the least effective North American practice — the so-called “lowest common denominator”—if such practice does not adequately protect Bulk-Power System reliability. Although the Commission will give due weight to the technical expertise of the ERO, we will not hesitate to remand a proposed Reliability Standard if we are convinced it is not adequate to protect reliability.”
- 9. Costs to be considered for smaller entities but not at consequence of less than excellence in operating system reliability**
“330. A proposed Reliability Standard may take into account the size of the entity that must comply with the Reliability Standard and the cost to those entities of implementing the proposed Reliability Standard. However, the ERO should not propose a “lowest common denominator” Reliability Standard that would achieve less than excellence in operating system reliability solely to protect against reasonable expenses for supporting this vital national infrastructure. For example, a small owner or operator of the Bulk-Power System must bear the cost of complying with each Reliability Standard that applies to it.”
- 10. Must be designed to apply throughout North American to the maximum extent achievable with a single reliability standard while not favoring one area or approach**

“331. A proposed Reliability Standard should be designed to apply throughout the interconnected North American Bulk-Power System, to the maximum extent this is achievable with a single Reliability Standard. The proposed Reliability Standard should not be based on a single geographic or regional model but should take into account geographic variations in grid characteristics, terrain, weather, and other such factors; it should also take into account regional variations in the organizational and corporate structures of transmission owners and operators, variations in generation fuel type and ownership patterns, and regional variations in market design if these affect the proposed Reliability Standard.”

11. No undue negative effect on competition or restriction of the grid

“332. As directed by section 215 of the FPA, the Commission itself will give special attention to the effect of a proposed Reliability Standard on competition. The ERO should attempt to develop a proposed Reliability Standard that has no undue negative effect on competition. Among other possible considerations, a proposed Reliability Standard should not unreasonably restrict available transmission capability on the Bulk-Power System beyond any restriction necessary for reliability and should not limit use of the Bulk-Power System in an unduly preferential manner. It should not create an undue advantage for one competitor over another.”

12. Implementation time

“333. In considering whether a proposed Reliability Standard is just and reasonable, the Commission will consider also the timetable for implementation of the new requirements, including how the proposal balances any urgency in the need to implement it against the reasonableness of the time allowed for those who must comply to develop the necessary procedures, software, facilities, staffing or other relevant capability.”

13. Whether the reliability standard process was open and fair

“334. Further, in considering whether a proposed Reliability Standard meets the legal standard of review, we will entertain comments about whether the ERO implemented its Commission-approved Reliability Standard development process for the development of the particular proposed Reliability Standard in a proper manner, especially whether the process was open and fair. However, we caution that we will not be sympathetic to arguments by interested parties that choose, for whatever reason, not to participate in the ERO’s Reliability Standard development process if it is conducted in good faith in accordance with the procedures approved by the Commission.”

14. Balance with other vital public interests

“335. Finally, we understand that at times development of a proposed Reliability Standard may require that a particular reliability goal must be balanced against other vital public interests, such as environmental, social and other goals. We expect the ERO to explain any such balancing in its application for approval of a proposed Reliability Standard.”

15. Any other relevant factors

“323. In considering whether a proposed Reliability Standard is just and reasonable, we will consider the following general factors, as well as other factors that are appropriate for the particular Reliability Standard proposed.”

“337. In applying the legal standard to review of a proposed Reliability Standard, the Commission will consider the general factors above. The ERO should explain in its application for approval of a proposed Reliability Standard how well the proposal meets these factors and explain how the Reliability Standard balances conflicting factors, if any. The Commission may consider any other factors it deems appropriate for determining if the proposed Reliability Standard is just and reasonable, not unduly discriminatory or preferential, and in the public interest. The ERO applicant may, if it chooses, propose other such general factors in its ERO application and may propose additional specific factors for consideration with a particular proposed reliability standard.”

Issues Related to the Applicability of a Standard

In Order No. 672, the Commission states that a proposed reliability standard should be clear and unambiguous regarding what is required and who is required to comply. Users, owners, and operators of the bulk power system must know what they are required to do to maintain reliability. Section 215(b) of the FPA requires all “users, owners and operators of the bulk power system” to comply with Commission-approved reliability standards.

The term “users, owners, and operators of the bulk power system” defines the statutory applicability of the reliability standards. NERC’s Reliability Functional Model (Functional Model) further refines the set of users, owners, and operators by identifying categories of functions that entities perform so the applicability of each standard can be more clearly defined. Applicability is clear if a standard precisely states the applicability using the functions an entity performs. For example, “Each Generator Operator shall verify the reactive power output capability of each of its generating units” states clear applicability compared with a standard that states “a bulk power system user shall verify the reactive power output capability of each generating unit.” The use of the Functional Model in the standards narrows the applicability of the standard to a particular class or classes of bulk power system users, owners, and operators. A standard is more clearly enforceable when it narrows the applicability to a specific class of entities than if the standard simply references a wide range of entities, e.g., all bulk power system users, owners, and operators.

In determining the applicability of each standard and the requirements within a standard, the drafting team should follow the definitions provided in the NERC Glossary of Terms Used in Reliability Standards and should also be guided by the Functional Model.

In addition to applying definitions from the Functional Model, the revised standards must address more specific applicability criteria that identify only those entities and facilities that are material to bulk power system reliability with regard to the particular standard.

The drafting team should review the registration criteria provided in the NERC Statement of Compliance Registry Criteria, which is the criteria for applicability. The registration criteria identify the criteria NERC uses to identify those entities responsible for compliance to the reliability standards. Any deviations from the criteria used in the Statement of Compliance Registry Criteria must be identified in the applicability section of the. It is also important to note that standard drafting teams cannot set the applicability of reliability standards to extend to entities beyond the scope established by the criteria for inclusion on NERC’s Compliance Registry. This is expressly prohibited by Commission Order No. 693-A.

The goal is to place obligations on the entities whose performance will impact the reliability of the bulk power system, but to avoid painting the applicability with such a broad brush that entities are obligated even when meeting a requirement will make no material contribution to bulk power system reliability.

Every entity class described in the Functional Model performs functions that are essential to the reliability of the bulk power system. This point is best highlighted with the example that might be the most difficult to understand, the inclusion of distribution providers. Section 215 of the FPA specifically excludes facilities used in the local distribution of electric energy. Nonetheless, some of the NERC standards apply to a class of entities called Distribution Providers. Distribution Providers are covered because, although they own and operate facilities in the local distribution of electric energy, they also perform functions affecting and essential to the reliability of the bulk power system. With regard to these facilities and functions that are material to the reliability of the bulk power system, a distribution provider is a bulk power system user. For example, requirements for distribution providers in the reliability standards apply to the underfrequency load shedding relays that are maintained and operated within the distribution system to protect the reliability of the bulk power system. There are also requirements for distribution providers to provide demand forecast information for the planning of reliable operations of the bulk power system.

A similar line of thinking can apply to every other entity in the Functional Model, including Load-serving Entities and Purchasing-selling Entities, which are users of the bulk power system to the extent they transact business for the use of transmission service or to transfer power across the bulk power system. NERC has specific requirements for these entities based on how these uses may impact the reliability of the bulk power systems. Other functional entities are more obviously bulk power system owners and operators, such as Reliability Coordinators, Transmission Owners and Operators, Generator Owners and Operators, Planning Coordinators, Transmission Planners, and Resource Planners. It is the extent to which these entities provide for a reliable bulk power system or perform functions that materially affect the reliability of the bulk power system that these entities fall under the jurisdiction of Section 215 of the FPA and the reliability standards. The use of the Functional Model simply groups these entities into logical functional areas to enable the standards to more clearly define the applicability.

Issues Related to Regional Entities and Reliability Organizations

Because of the transition from voluntary reliability standards to mandatory reliability standards, confusion has occurred over the distinction between Regional Entities and Regional Reliability Organizations. The regional councils have traditionally been the owners and members of NERC. They have been referred to as Regional Reliability Organizations in the Functional Model and in the reliability standards. In an era of voluntary standards and guides, it was acceptable that a number of the standards included requirements for Regional Reliability Organizations to develop regional criteria, procedures, and plans, and included requirements for entities within the region to follow those requirements. Section 215 of the FPA introduced a new term, called “Regional Entity.” Regional Entities have specific delegated authorities, under agreements with NERC, to propose and enforce reliability standards within the region, and to perform other functions in support of the electric reliability organization. The former Regional Reliability Organizations have entered into delegation agreements with NERC to become Regional Entities for this purpose.