Background:

The Phase III & IV drafting team thanks all who submitted comments on the first posting of the Phase III & IV Standards. After careful review and consideration of the comments received, the drafting team has modified the standards and is posting the standards in two separate sets – with Set One to be posted from September 1 – October 15 and Set Two to be posted later this fall.

This 'Consideration of Comments' document only includes the comments on the standards that are in 'Set One' and they are listed in the Index on the following pages. Note that the drafting team organized the sequence of standards in this document so they are listed in alphanumeric order by topic.

The drafting team encourages you to read the 'Background Information' posted with draft 2 of the revised standards. The Background Information provides an overview of the most significant changes made to the Phase III & IV Standards in response to stakeholder comments. In this document, stakeholder comments have been organized so that it is easier to see the summary of changes being requested of each standard. The comments can be viewed in their original format at:

http://www.nerc.com/~filez/standards/Phase-III-IV.html

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Manager of Standards, Mark Ladrow at 609-452-8060 or at mark.ladrow@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.[1]

[1] The appeals process is in the Reliability Standards Process Manual: http://www.nerc.com/standards/newstandardsprocess.html.

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Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-020-1 Undervoltage Load Shedding Program Database

Pacific Gas and Electric			A3 The purpose should be expanded to preclude the loss of offsite power to nuclear power plants.
Response: This is not the primary purpose for this reliability standard.			
Transmission Subcommittee			PRC-020-1, R2: TS recommends including criteria to waive PRC-020 requirements from those RROs that do not have or need Under-Voltage Load Shedding (UVLS) programs. Also, the TS recommends using language that is consistent with PRC-021, and PRC-022, that applies the PRC-020 requirements to the RROs whose Transmission Owners, Transmission Operators, Load-Serving Entities, and Distribution Providers "that owns or operates an UVLS program."
Response: The 'applicability' portion of the standard was modified to clarify that these requirements are only applicable to RROs with entities that own or operate UVLS programs.			
Southern Company Generation Southern Company – Transmission	Yes Yes	No No	The title of the Standard should be changed to end with "….Data repository" vs. "Data base".
Response: Data base is the more commonly used term			
Consolidated Edison Alan Adamson – NYSRC Cinod Kotecha Kathleen Goodman – ISO-NE	Yes Yes Yes Yes	No No No Yes	The scope of the UVLS database should be limited to systems that can affect the Bulk Electric System. Many UVLS systems are quite local in nature, and independent from other systems. The approach to UV should not be the same as that for underfrequency as UFLS is a single distributed system.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Ed Riley – California ISO ISO/RTO Council Standards Review Committee NPCC CP9 RSWG IESO	Yes Yes Yes Yes	Yes Yes Yes Yes	
Response: The standard was modified in support of your suggestion.			
NERC System Protection and Controls Task Force	Yes	No	1. The purpose does not reflect the standard. It should be modified to read: Document Under-Voltage Load Shedding (UVLS) programs intended to mitigate the risk of system voltage collapse or voltage instability. — 2. Modify R1.1 to state: Size and location of customer load, or percent of connected load at each location, to be interrupted. To address generation connected to lower-voltage level systems and its potential impact on UVLS, add a requirement for: Size, location, and characteristics of generators connected to the system elements being interrupted. – – 3. UVLS schemes need to be differentiated between those intended for local protection and those intended to mitigate the risk of interconnected system collapse.
Response: 1. The purpose was revised to clarify that the standard's scope is limited to UVLS programs that affect the BES and to clarify that the associated database is needed for Regional studies and for dynamic studies and simulations of the BES. 2. Your suggested revision for R1.1 was adopted. 3. A qualification was added to clarify that the UVLS programs addressed in this standard are those that were installed for BES reliability.			
Xcel Energy – Northern States Power	Yes	No	Identification of the owner of the UVLS program should be included in the list of requirements. Just a carbon copy of what is listed in PRC-021-1 is not an acceptable means of defining requirements between what an RRO and an individual entity must meet. This is especially

Commenters	Reliability Need?	Acceptable Translation?	Comments
			important as different owners of UVLS programs may have different criteria established which could have significant Regional impacts.
Response: Identification of the owner was added to the list of information that must be included in the database. The requirements in the two standards need to align with one another because they are both referencing the same data needed for the RRO's database.			
SPP Transmission Working Group	Yes	No	R1.3 and R1.4 sounds like an application guide, not a standard. Planning Authority needs to be included in PRC-006 and other UVLS standards. No requirement for RRO to coordinate UVLS within the region if it exist.
Response: The information requested in R1.3 and R1.4 is for the RRO's database on UVLS programs. The UVLS database is used for Regional studies and for dynamic studies and simulations of the BES and will be useful for assessments required to be accomplished under PRC-010-0. Addressing PRC-006 I outside the scope of this drafting team. Coordination should take place between entities during the planning (PRC-010-0) for UVLS programs. This standard is limited to establishing requirements for a database of information for UVLS programs that have been installed for BES reliability.			
FRCC	Yes	No	R1.5 - R1.8 should not be requirements within the standard. While these items should be considered during the development of a UVLS scheme, this level of detail should not be reported to or monitored by the RRO.
Response: The information requested in R1.5 through R1.8 is for the RRO's database on UVLS programs. This information is needed for Regional studies and for dynamic studies and simulations of the BES and will be useful for assessments required to be accomplished under PRC-010-0.			
Mark Kuras – MAAC	Yes	No	Level 1 text should be moved to level 3 or be given a clearer, more crisp way to determine incompleteness.
Response: The levels of non-compliance were revised and no longer use the word, 'incomplete'.			
Individual Members	Yes	No	Level 1 uses the words "was incomplete". What does this mean? It is "assumed" that R1.1 through R1.8 states the "complete' database. If there are 100 locations per R1.1 then there

Commenters	Reliability Need?	Acceptable Translation?	Comments
of CCMC			better be corresponding items for R1.2, etc. The words should be modified if this assumption is correct. Also the levels do not cover the "annual update" requirement in R1.
Response: The levels of non-compliance were revised to address your concerns. The revised standard's levels of non-compliance do address the 'annual update' and no longer use the word, 'incomplete'.			
Joseph D Willson– PJM	No	No	Level 1 "was incomplete" what does this mean? This is not measurable. Also non-compliance can only be judged if NERC requests the information? If that is the case this is a data reporting responsibility and not a reliability standard.
Response: The levels of non-compliance were revised and no longer use the word, 'incomplete'. The standard was revised to indicate the information in the database must be made available to Planning Authorities and Transmission Planners as well as NERC. The UVLS database is used for Regional studies and for dynamic studies and simulations of the BES			
Peter Burke – American Transmission Co.	Yes	Yes	There could be value in having a Regional UVLS program, similar to the existing Regional UFLS programs in place. Having a set of comprehensive standards that define consistent requirements for all entities participating in a coordinated Regional UVLS program may require a thorough review and revision of the entire existing set of UVLS standards (PRC-020, PRC-021, PRC-022, PRC-010 and PRC-011). However, a regional database could be useful, irrespective of whether a Regional UVLS program exists or not. Note that the regional database allows interested entities (TP, PA) to verify the coordination of their UVLS systems with others.
Response: Agree. Most stakeholders supported this standard as presented.			
Transmission Issues Subcommittee	Yes	Yes	TIS agrees with PRC-001
Response: This comment seems misplaced.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	1. Purpose: Is not reflected in the requirements there is no requirement to implement UVLS programs. Based on the requirements, the purpose is "to maintain and update a database of the UVLS prograoms. 2. R1: Add the word "establish" before "maintain and annually update". Modify M!

Commenters	Reliability Need?	Acceptable Translation?	Comments
			accordingly. 3. Also. I suggest adding a R1.9 requiring that the UVLS program be documented to describe its purpose, and expected operating scenario. Levels of non-compliance: 4. Level 1: How does one determine if the database provided in incomplete? 5. Should there be non-compliance if the RRO does not update the database annually? 6. This standard and PRC-021-1 need to require coordination with other UVLS programs within the region and with other regions.
Response: 1. The purpose was revised to clarify that the standard's scope is limited to UVLS programs that affect the BES and to clarify that the associated database is needed for Regional studies and for dynamic studies and simulations of the BES. 2. The word, 'establish' was added to R1 as suggested. 3. The items suggested are performance features that aren't needed for the intended purpose of this database. 4. The levels of noncompliance were revised and no longer use the term, 'incomplete'. 5. The revised standard does include noncompliance for failure to do an annual update. 6. Coordination should take place between entities during the planning (PRC-010-0) for UVLS programs. This standard is limited to establishing requirements for a database of information for UVLS programs that have been installed for BES reliability.			
Doug Hohbough – First Energy Corp.	Yes	Yes	Since there is no requirement in R1 to include information about how the loads are modelled, I assume this information would already exist in the dynamic model from data obtained through other NERC standards.
Response: This is outside the scope of this standard.			
Entergy John K. Loftis, Jr. – Dominion – Electric Transmission SERC EC Planning	Yes Yes	Yes Yes	The requirement to annually update the databases is in both R1 and R2. Suggest R2 be changed go read: "The Regional Reliability Organization shall provide the current UVLS database to NERC within 30 calendar days of a request." Recommend first sentence of R1 be changed to read: "The Regional Reliability Organization shall establish requirements for, maintain, and annually update a UVLS

Commenters	Reliability Need?	Acceptable Translation?	Comments
Standards Subcommittee (PSS)	Yes	Yes	program database."
Response: The requirement to annually update the databases was removed R2 as suggested. R1 was modified in support of your suggestion to read, "…shall establish, maintain, and annually update a UVLS program database…"			
Midwest Reliability Organization	Yes	Yes	1. Change "incomplete" to a measurable quantity, such as "did not include one or more of the eight required items in R1.1 - R1.8." 2. A5. Change proposed effective date from October 1 to November 1. 3. The standards for PRC-020-1 and PRC-021-1 need to require coordination with other UVLS programs within the region and with other regions. These two standards require data submittal, but do not require any implementation or use of the data. The implementation/use of this data should be similar to the UFLS data. The UVLS standards should have similar corresponding requirements to the current UFLS standards.
Response: 1. The levels of noncompliance were revised and no longer use the term, 'incomplete'. 2. The proposed effective date was corrected and is now targeted for February 6, 2006. 3. Coordination should take place between entities during the planning (PRC-010-0) for UVLS programs. This standard is limited to establishing requirements for a database of information for UVLS programs that have been installed for BES reliability.			
Kansas City Power and Light	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Howard Rulf - WE Energies	Yes	yes	

Consideration of Comments on PRC-020-1 Undervoltage Load Shedding Program Database

Commenters	Reliability Need?	Acceptable Translation?	Comments
Michael C. Calimano – NYISO	Yes	Yes	
WECC Reliability Subcommittee	Yes	Yes	`
Rebecca Berdahll – BPA Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Karl Kohlrus - City Water, Light & Pwr	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
John Horakh – MACC	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
Gred Mason – Dynergy	Yes		

Commenters	Reliability Need?	Acceptable Translation?	Comments
Generation			
Mohan Kondragunta – Southern CA Edison	Yes	Yes	

Comments on Field Testing and Effective Date:

Summary Consideration: The drafting team is recommending there be a 3 month delay between the date of the BOT adoption and the 'effective' date to give the RRO time to formalize its documentation.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		The Regional Reliability Organization needs time to develop the UVLS database.
Response: The three month delay for the 'effective' date should give the RRO time to formalize its documentation.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-021-1 Undervoltage Load Shedding Program Data

Pacific Gas and Electric Richard Padilla Greg Reimers			A3 The purpose should be expanded to preclude the loss of offsite power to nuclear power plants.
Response: This is not the primary purpose for this reliability standard.			
Kansas City Power and Light	Yes	No	It appears that this standard is redundant to PRC-011-0
Response: Please be more specific in identifying how you think this is redundant to PRC-011-0. PRC-011-0 requires UVLS system owners to have a UVLS maintenance and testing program for those UVLS systems; PRC-021 requires UVLS program owners to provide information about those UVLS programs to their RRO.			
Cinod Kotecha Consolidated Edison IESO – Ontario Alan Adamson – NYSRC Kathleen Goodman – ISO-NE NPCC CP9 RSWG Ed Riley – California ISO ISO/RTO Council Standards Review Committee	Yes Yes Yes Yes Yes Yes Yes Yes Yes	No Yes Yes Yes Yes Yes Yes Yes Yes	The scope of the UVLS database should be limited to systems that can affect the Bulk Electric System. Many UVLS systems are quite local in nature, and independent from other systems. The approach to UV should not be the same as that for underfrequency as UFLS is a single distributed system.
Response:			

Commenters	Reliability Need?	Acceptable Translation?	Comments
The purpose statement was modified in support of your suggestion.			
NERC System Protection and Controls Task Force	Yes	No	The purpose does not reflect the standard. It should be modified to read: Document Under-Voltage Load Shedding (UVLS) programs intended to mitigate the risk of system voltage collapse or voltage instability. — Modify R1.1 to state: Size and location of customer load, or percent of connected load at each location, to be interrupted. To address generation connected to lower-voltage level systems and its potential impact on UVLS, add a requirement for: Size, location, and characteristics of generators connected to the system elements being interrupted. — UVLS schemes need to be differentiated between those intended for local protection and those intended to mitigate the risk of interconnected system collapse.
Response: The purpose was revised to clarify that the standard should support the Regional database maintained for UVLS programs implemented to mitigate the risk of voltage collapse or voltage instability in the BES. R1.1 was modified to match the changes made to R1.1 in the companion standard, PRC-020-1. R1.1			
FRCC	Yes	No	R1.5 - R1.8 should be replaced with a new R1.5 that states - Information on related islanding schemes, load restoration scheme or related generator protection, as appropriate. This information should only be collected when it provides information that is necessary to evaluate the effectiveness of the UVLS program.
Response: The data is provided to the Region and then used for Regional studies and for dynamic studies and simulations of the BES. The information isn't collected to evaluate the effectiveness of the UVLS program.			
Individual Members of CCMC	Yes	No	Level 2 needs to be consistent with R1. It needs words to check if the need for update was done every year and was updated if appropriate.
Response: The levels of non-compliance were modified to improve consistency with the requirements.			
Joseph D Willson– PJM	No	No	Level 2 needs to be consistent with R1. R1 states "entity shall annually update its UVLS data as necessary" does this mean that if it doesn't change you don't need to update it annually? This is a data reporting obligation and not a reliability standard.
Response: Because providing the data is essential to having a database that can be used to support Regional studies and dynamic studies and			

Commenters	Reliability Need?	Acceptable Translation?	Comments
simulations of the BES, providing the data may be a reporting requirement but it is also critical to reliability.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	Purpose: The pupose appears to be to require an entity to provide data annually if it owns and operates a UVLS program. This standard and PRC-020-1 need to require coordination with other UVLS programs within the region and with other regions.
Response: The purpose was revised to clarify that this standard is only applicable to owners of UVLS systems installed for BES reliability. Coordination is already required by PRC-010 Requirement 1.1.1.			
Transmission Issues Subcommittee	Yes	Yes	This standard should clarify the scope of UVLS systems covered. This standard should not include localized UVLS schemes.
Response: Agree. The purpose was revised to clarify that this standard is only applicable to owners of UVLS systems installed for BES reliability.			
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	In response to the question in the blue box as to whether UVLS and UFLS standards should mirror each other, the PSS does not believe that the UVLS standards need to exactly mirror the UFLS standards. The PSS recommends that no regional program standard development be pursued via the SARs process. UFLS and UVLS are very different in the system problems they are designed to arrest. UFLS is necessary across the Interconnections since frequency deviations propagate throughout. Voltage problems are more localized phenomena. Therefore, to attempt to mandate Regional UVLS requirements would not allow flexibility to implement prudent solutions for systems. Change 4.4 to read: "Load-Serving Entity that operates a UVLS program."
Response: The standard was modified to assign requirements to just the 'functions' that 'own' UVLS programs (TO and DP).			
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	The UVLS standards should not mirror exactly the UFLS standards. UFLS and UVLS are very different in the system problems they are designed to arrest. UFLS is necessary across the interconnections since frequency deviations propagate throughout. Voltage problems are more localized phenomena. Therefore, to attempt to mandate Regional UVLS requirements would not allow flexibility to implement prudent solutions for systems.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			Change 4.4 to read: Load-Serving Entity that operates a UVLS program.
Response: The UVLS standards have been revised so they address many of the same topics, but don't mirror the UFLS standards. The standard was modified to assign requirements to just the 'functions' that 'own' UVLS programs (TO and DP).			
Doug Hohbough – First Energy Corp.	Yes	Yes	Since there is no requirement in R1 to include information about how the loads are modelled, I assume this information would already exist in the dynamic model from data obtained through other NERC standards.
Response: This is outside the scope of this standard.			
Midwest Reliability Organization	Yes	Yes	2.1 Change "incomplete" to a measurable quantity, such as "did not include one or more of the eight required items in R1.1 - R1.8." A5. Change proposed effective date from October 1 to November 1. The standards for PRC-020-1 and PRC-021-1 need to require coordination with other UVLS programs within the region and with other regions. These two standards require data submittal, but do not require any implementation or use of the data. The implementation/use of this data should be similar to the UFLS data. The UVLS standards should have similar corresponding requirements to the current UFLS standards.
Response: The first comments seems applicable to PRC-020, not PRC-021. The proposed effective date was updated to February 6, 2006. Coordination should take place between entities during the planning (PRC-010-0) for UVLS programs. PRC-020 was modified to require the RRO to make its UVLS database available to those Planning Authorities and Transmission Planners with a reliability-related need for the data.			
Entergy	Yes	Yes	In response to the question in the blue box as to whether UVLS and UFLS standards should mirror each other, the PSS does not believe that the UVLS standards need to exactly mirror the UFLS standards. The PSS recommends that no regional program standard development be pursued via the SARs process. UFLS and UVLS are very different in the system problems they are designed to arrest. UFLS is necessary across the Interconnections since frequency deviations propagate throughout. Voltage problems are more localized phenomena. Therefore, to attempt to mandate Regional UVLS requirements

Commenters	Reliability Need?	Acceptable Translation?	Comments
			would not allow flexibility to implement prudent solutions for systems. Change 4.4 to read: "Load-Serving Entity that operates a UVLS program."
Response: The standard was modified to assign requirements to just the 'functions' that 'own' UVLS programs (TO and DP).			
John Horakh – MACC	Yes	Yes	It appears that there is a need for a Regional UVLS program. Otherwise, it is difficult to coordinate individual UVLS programs.
Response: The purpose of the regional database is to collect UVLS data in order to support Regional studies and dynamic simulations of the BES. The database facilitates the coordination of various UVLS programs within the region. However, the UVLS-owning entities are responsible for the coordination of their respective UVLS programs, as required in PRC-010, an approved V0 standard.			
Peter Burke – American Transmission Co.	Yes	Yes	May need to be revised to address comments on PRC-020 for Regional UVLS program.
Response: Agreed. PRC-020 and PRC-021 are companion standards and changes made to one standard do need to be reflected in the other standard as suggested.			
WECC Reliability Subcommittee	Yes	Yes	`
SPP Transmission Working Group	Yes	Yes	
Howard Rulf - WE Energies	Yes	yes	
Michael C. Calimano – NYISO	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Mark Kuras – MAAC	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
Raj Rana – AEP	Yes	No Answer	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Gred Mason –	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Dynergy Generation			
Mohan Kondragunta – Southern California Edison	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team is recommending there be a 3 month delay between the date the RRO must complete its Regional requirements and the date that entities must provide data.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		The entities need time to develop the UVLS program, if required.
Response: The three month delay for the 'effective' date should give entities time to collect the needed data.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-022-1 Undervoltage Load Shedding Program Performance

Pacific Gas and Electric			A3 The purpose should be expanded to preclude the loss of offsite power to nuclear power plants.
Response: This is not the primary purpose for this reliability standard.			
Individual Members of CCMC	Yes	No	Levels reference PRC-002, should be PRC-022.
Response: These typographical errors have been corrected.			
Consolidated Edison Alan Adamson – NYSRC IESO – Ontario NPCC CP9 RSWG Kathleen Goodman – ISO-NE Ed Riley – California ISO ISO/RTO Council Standards Review Committee	Yes Yes Yes Yes Yes Yes Yes	No No No No No No No	The scope of the standard should be limited to systems that can affect the Bulk Electric System. Simulation of all operations of UVLS seems onerous and it is recommended that simulations should only be performed for reportable incidents.
Response: This standard is limited to the schemes that impact the BES so there will be very few UVLS systems. Each event involving the operation or misoperation of a UVLS program needs to be investigated because of its actual or potential impact on the BES. The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events (trips) should be sufficient and dynamic simulations may not be needed.			
Cinod Kotecha	Yes	No	The scope of the standard should be limited to systems that can affect the Bulk Power System. The performance of the program should be tested with and without shunt reactor tripping, where necessary. Simulation of all operations of UVLS seems onerous and it is recommended that

Commenters	Reliability Need?	Acceptable Translation?	Comments
			simulations should only be performed for reportable incidents.
Response: This standard is limited to the schemes that impact the BES so there will be very few UVLS systems. Each event involving the operation or misoperation of a UVLS program needs to be investigated because of its actual or potential impact on the BES. The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events (trips) should be sufficient and dynamic simulations may not be needed.			
Michael C. Calimano – NYISO	Yes	No	Simulatoin of all operations of UVLS seems onerous and it is recommended that simulations should only be performed wherte UVLS operation was not intended.
Response: The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events (trips) should be sufficient and dynamic simulations may not be needed.			
SPP Transmission Working Group	Yes	No	This is a planning authority function.
Response: The analysis may be done by the Planning Authority (or the Transmission Planner), but it is the facility operator that is responsible for ensuring that the analysis is done.			
Kansas City Power and Light	Yes	No	This standard should be included as a planning authority function.
Response: The analysis may be done by the Planning Authority (or the Transmission Planner), but it is the facility operator that is responsible for ensuring that the analysis is done.			
WECC Reliability Subcommittee Mohan Kondragunta – Southern California Edison		No No	It is not practical to determine all UVLS misoperations and failures because it is not practical to have monitors on all UVLS locations.
Response: The scope of the standard was modified to limit applicability to UVLS programs installed to protect the BES. We will ask the industry if it has the capability of analyzing all UVLS operations and misoperations involving UVLS programs installed to protect the BES.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Deborah M. Linke – US Bureau of Reclamation Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes Yes	No No	We support comments made by WECC RS "it is not practical to determine all UVLS misoperations and failures because it is not practical to have monitors on al UVLS locations."
Response: The scope of the standard was modified to limit applicability to UVLS programs installed to protect the BES. We will ask the industry if it has the capability of analyzing all UVLS operations and misoperations involving UVLS programs installed to protect the BES.			
Mark Kuras – MAAC	Yes	No	Change …prevent… to …reduce the possibility… Prevent is too strong. If another misoperation occurs, for whatever reason, you are non-compliant with R1.5.
Response: Agree – the language was modified to support your suggestion.			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	R1.3 – was not in the original standard and should not be included. The simulation of the event will only be as good as the assumptions used and probably only result in a best guess.
Response: The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events (trips) should be sufficient and dynamic simulations may not be needed.			
FRCC	Yes	No	Eliminate R1.3 - The simulation of the event. While the simulation of some UVLS events may be valuable, simulation of all events should not be a requirement. For example, there would not be any system reliability benefit in simulating an inadvertent operation of a UVLS that results in a small load loss. Level 2 and Level 3 of non-compliance are based on the requirements in PRC-002. It is not appropriate to base non-compliance of this standard on the requirements and measurements of other standards. The levels of non-compliance should only be based on

Commenters	Reliability Need?	Acceptable Translation?	Comments
			requirements and measurements contained in this standard.
Response: The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. For most events, analysis of sequence of events (trips) should be sufficient and dynamic simulations may not be needed. The reference to PRC-002 was a typographical error and should have referenced this standard, PRC-022. This typographical error has been corrected.			
Joseph D Willson – PJM	No	No	This is an after the fact analysis. It is something that needs to be done but is not at the level of a reliability standard.
Response: Ensuring that UVLS programs that affect the BES are working correctly is a reliability concern and most commenters support this as a standard.			
Tennessee Valley Authority	Yes	No	TVA suggests clarifying this by defining simulation as including sequence of events analysis as opposed to only computer simulations. The validation of models takes extensive effort and is likely beyond the resources of most if not all entities covered by this standard.
Response: The standard was revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization. The standard states that, for most events, analysis of sequence of events (trips) may be sufficient and dynamic simulations may not be needed.			
Peter Burke – American Transmission Co.	Yes	Yes	May need to be revised to address comments on PRC-020 for Regional UVLS program.
Response: The drafting team tried to keep the standards in alignment with one another.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	Purpose: There is no requirement to implement an UVLS program, just to analyze and document operation of the UVLS program if an entity has one.
Response: Agree. The purpose statement was revised to more accurately identify the purpose of the standard.			
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	Add the word program to the end of 4.1, 4.2, 4.3, and 4.4. There is an omission in Section D (Compliance), Item 1.3 (Data Retention) that needs to be clarified. Item 1.3 currently reads: Each Transmission Owner, Transmission Operator, Load Serving Entity and Distribution Provider that owns or operates a UVLS program shall "?" data for two years.
Response: The word, 'program' was added as suggested. The Data Retention section was corrected. As you suggested, some of the text had been truncated.			

PRC-022-1 Undervoltage Load Shedding Program Performance

Commenters	Reliability Need?	Acceptable Translation?	Comments
Transmission Issues Subcommittee	Yes	Yes	This standard should clarify the scope of UVLS systems covered. This standard should not include localized UVLS schemes. R1.3 currently could result in unnecessary ssimulations. 1.3 should be modified to state that simulation of events should be as deemed appropriate by the RRO.
Response: The scope of the standard was modified to limit applicability to UVLS programs installed to protect the BES. The standard was also revised so that a simulation of an event is only required if deemed appropriate by the Regional Reliability Organization.			
Raj Rana – AEP	Yes		R2 requires 30 days to provide a report on an event. The standards should allow latitude for events which require more than 30 days to complete an analysis.
Response: The time to provide a report was changed to 90 days in support of your comment.			
Entergy SERC EC Planning Standards Subcommittee (PSS)	Yes Yes	Yes Yes	Add the word "program" to the end of 4.1, 4.2, 4.3, and 4.4
Response: The word, 'program' was added as suggested.			
Midwest Reliability Organization	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Howard Rulf - WE Energies	Yes	yes	

PRC-022-1 Undervoltage Load Shedding Program Performance

Commenters	Reliability Need?	Acceptable Translation?	Comments
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Doug Hohbough – First Energy Corp.	Yes	Yes	
John Horakh – MACC	Yes	Yes	
NERC System Protection and Controls Task Force	Yes	Yes	No Comments
Gred Mason – Dynergy Generation	Yes	Yes	

Comments on Field Testing and Effective Date:

Summary Consideration: The drafting team is recommending there be a 3 month delay between the date the BOT adopts the standard and the 'effective' date. This delay gives entities time to prepare to run simulations and to establish a format for reports and mitigation plans.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		PRC-022-1 is dependent on development of PRC-021-1**.**
Response: PRC-022 is not dependent on PRC-021. (PRC-021 is dependent on PRC-020)			

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-002-1 Define and Document Regional Disturbance Monitoring and Reporting

Entergy			(From Q 4 – Other comments) Please change "any" to "either" in Levels of Non-Compliance 2.1 Level 1. Please delete the "or" at the end of Levels of Non-Compliance 2.4.1.
Response: The levels of non-compliance have been significantly revised such that the proposed changes are no longer relevant.			
Pacific Gas and Electric			This standard is not applicable to nuclear power plant generators per Section 4.1. However, R1.6.3 implies that generators may have some installation requirements. If additional disturbance monitoring equipment is required for nuclear facilities, a two year advance notice is required for installation.
Response: This standard is applicable to Regional Reliability Organizations. RROs may develop requirements for all power plants, including nuclear power plants.			
NERC Interconnection Dynamics Working Group	Yes	No	See MOD-022-1
Response: See the comments and the responses at the end of this file.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	No	Further definition of time synchronization needs to be completed to provide clarity and acceptable translation.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The standard was revised to specify what was meant by time synchronization.			
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	Is Disturbance Monitoring equipment necessary and if so, what are the specifications of this equipment? Can a Data Acquisition System meet these requirements? The ECAR document 14, we just reviewed, it allowed up to 5 years for the Disturbance Monitoring equipment to be installed. I suggest possibly 5 years or maybe even adding in the Implementation phase that was put in Doc 14.
Response: Yes DME is necessary. This standard is a companion to PRC-018. The Implementation Plan for PRC-018 will include a timetable for meeting compliance, including compliance with PRC-018 Requirement 1 which requires entities to install DMEs.			
Gred Mason – Dynergy Generation	Yes	No	1. Generation Owners and Transmission Owners should be added to Section 4, Applicability 2. Section B,R1 should be modified to read as follows:"…The Regional Reliability Organization shall, in coordination with Generation Owners and Transmission Owners, establish…"Regions should be required to involve Generation Owners and Transmission Owners when establishing the required procedures.
Response: No – the requirements need to be set at the Regional Level to ensure that there is some consistency at a high level so that data can be exchanged in a usable format. Most stakeholders seemed to agree that the Region should be responsible for the requirements in this standard. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements.			
ISO/RTO Council Standards Review Committee	Yes	Yes and No	The information gathered from distrubance monitoring equipment can be imperfect. Coupled with a wider body of information it can be used to determine system performance and root causes of disturbances. Modify R1 to add the word …help (or assist) "… data is available to [assist/help] determine system performance …" in R1.
Response: Agree R1 was extensively rewritten based on stakeholder comments.			
Mark Kuras – MAAC	Yes	No	Remove the instances of the word …comprehensive… in R1 because it does not add anything. Add the word …help… between the words …data is available to… and

Commenters	Reliability Need?	Acceptable Translation?	Comments
			…determine system performance in R1. The information gathered is not perfect and with other information it can hopefully be used to determine system performance and causes of disturbances. In R3 the is a requirement to provide data. To whom?
Response: The word, 'comprehensive' was removed as suggested. The standard was extensively rewritten and the revised standard indicates that the RRO will specify who should receive data.			
Joseph D Willson– PJM	Yes	No	The levels of non-compliance seems to be focused of making sure that as many possible things are included and not focused on which requirements are critical to reliability . the levels of non-compliance must be re-written to have only meaningful elements.
Response: The levels of non-compliance have been significantly revised.			
Individual Members of CCMC	Yes	No	The levels of non-compliance seem to be focused of making sure that as many things as possible are included and not focused on which requirements are critical to reliability. SDT provide a priority list so levels can be rewritten to reflect reliability. The levels of non-compliance must be re-written to have only meaningful elements. SDT provide a priority list so levels can be rewritten to reflect reliability.
Response: The levels of non-compliance have been significantly revised.			
Mohan Kondragunta – Southern California Edison	Yes	Yes	SCE suggets modifying this so that the time synchronization requirement applies to EHV systems (220 kV and above) only.
Response: The standard requires each Region to identify criteria for installation of DMEs, and this criteria must address a minimum list of elements such as equipment location, elements to be monitored, etc. This allows each Region to specify what is needed to ensure that within that Region, any Bulk Electric System Disturbance will be monitored and recorded.			
Mark A. Heimbach – PPL John J. Winders Jr – Electric Utilities John J. Esposito –	Yes	Yes	PPL strongly supports the us of disturbance data wherever possible in lieu of requiring generator testing. Therefore, clear requirements for the installation of, and reporting from this equipment is essential. Adequate time must be granted to allow for the budgeting, engineering, and installation of this equipment where it currently does not exist.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Generation Joseph V. Kisela – Generation Augustus J. Wilkins – Montana David L. Gladey - Susquehanna			
Response: Agree. This standard is a companion to PRC-018. The Implementation Plan for PRC-018 will include a timetable for meeting compliance, including compliance with PRC-018 Requirement 1 which requires entities to install DMEs.			
WECC Reliability Subcommittee	Yes	Yes	The WECC RS agrees with including time synchronization as one of the equipment characteristics that the Regional Reliability Organization requirements should address. If R1.2.2 is meant to indicate that the RRO will determine which facilities require time synchronization, and include this in their regional requirements, then the WECC RS agrees with the translation. For example, if R1.2.2 would allow for a Regional Reliability Organization to include in its regional requirements that all disturbance monitors for voltages above 220 kV must have time synchronization, then the WECC RS agrees with the translation. If R1.2.2 is meant to indicate that each RRO must identify in its regional requirements that all disturbance monitoring equipment must have time synchronization, then the WECC RS does not agree with the translation. Agreement with the acceptable translation will depend on the response to the question above.
Response: Additional details were added to the time synchronization reference – the revised standard indicates that for the three types of DMEs addressed in the standard, data must be time synchronized to UTC.			
John K. Loftis, Jr. – Dominion – Electric Transmission SERC EC Planning Standards Subcommittee (PSS)	Yes Yes Yes	Yes Yes Yes	As written this Standard states that disturbance data from installed devices is necessary to determine causes of disturbances, and is necessary to develop, verify and update system models. Recommend softening this position with alternate wording (i.e., valuable, useful, or helpful may be substituted for necessary).

Commenters	Reliability Need?	Acceptable Translation?	Comments
Entergy			
Response: The purpose was revised and the reference to modeling was removed.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	Purpose: may be to validate models, but not to develop them. R1: add a requirement for frquency of testing. R2: change "within 30 calendar days of the approval of a revision" to "within 30 calendar days of approval of the requirements or subsequent revision". R4: same as for R2 above.
Response: The purpose was revised and the reference to models was removed. The RROs requirements may include a requirement that addresses frequency of testing. R2 and R4 were modified to indicate that the distribution has to take place after the initial development of the requirements and after any approved change to those requirements.			
FRCC	Yes	Yes	R1 - delete the word "comprehensive" or define "comprehensive" so that the requirements are clear and measurable. R2 & R4 - There is not a reliability need to provide this data to "other Regional Reliability Organizations". Delete refereneces to "other Regional Reliability Organizations" in both R2 & R4. D.1.4 - Need to define who can file a complaint and what constitutes an event that would trigger an audit. Section D2 - Levels of Non-Compliance should be condensed to remove repetitive language and remove references to the "old" planning standards.
Response: The word ‘comprehensive’ was removed as suggested. The requirement to distribute Regional DME requirements to other Regions was removed as suggested. The criteria for filing a complaint is addressed by Regional Compliance Enforcement programs and is outside the scope of the standard.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
The levels of non-compliance were significantly modified.			
Raj Rana – AEP	Yes	Yes	Modify Definition of Disturbance Monitoring equipment to include “Microprocessor relays.” In R1.1 – add to parenthetical “Microprocessor Relays.”
Response: The definition of Disturbance Monitoring Equipment was modified to clarify that this includes Sequence of Event Recorders, Fault Recorders and Dynamic Disturbance Recorders. The definition of Fault Recorders includes a phrase indicating that protective relays may be used as fault recorders.			
Midwest Reliability Organization	Yes	Yes	1. R1. Following "The comprehensive requirements" add "shall be directed to the Transmission Owner and/or Generator Owner (and clarify responsible entity) and". 2. R1.6 Change "Installation requirements:" to "Regional criteria on installation requirements for:"
Response: 1. The suggested clarification doesn’t seem necessary. 2. This seems self-evident. All the elements identified are ‘regional criteria’ – so adding this heading doesn’t seem necessary.			
Doug Hohbough – First Energy Corp.	Yes	Yes	R1.3 could be combined as a subsection under R1.2. Not sure of the need to differentiate between equipment characteristics and capabilities. Otherwise the R1.3 list under R1.3 should include a reference to digital inputs for sequence of events monitoring.
Response: The standard was revised and equipment characteristics and capabilities were combined as a single topic as suggested. The standard is now looking at DME functions rather than specific types of equipment.			
NERC System Protection and Controls Task Force	Yes	Yes	M4 - modify last phrase to indicate for consistency with M2: to other Regional Reliability Organizations and NERC within 30 calendar days of a request --- The standard lacks specificity for requirements, such as a standard time reference, data formats, file naming, frequency traces, recording duration, triggering, etc. These are necessary for analysis of interregional events.
Response: Agree. The standard was modified to require distribution to the Transmission Owners and Generator Owners rather than NERC and other RROs. The standard was extensively revised to include more specific requirements.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
WECC Disturbance Monitoring Work Group	Yes	Yes	There appears to be a minor formatting inconsistency between the Requirements referenced in Non-compliance Level 1 and the Requirements referenced in Non-compliance Levels 2 - 4 (in the clean version of the posted Standard). Either they should all have underscores, or none of them should.
Response: A new format for cross referencing requirements within and between standards was established by NERC's Director-Standards and the new format does not include any underscores, so these have all been removed.			
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
NPCC CP9 RSWG	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
Cinod Kotecha	Yes	Yes	
IESO – Ontario	Yes	Yes	
Kansas City Power and Light	Yes	Yes	
Alan Adamson – NYSRC	Yes	Yes	
Dan Griffiths – PA Office of	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Consumer Advocate			
Ed Riley – California ISO	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
John Horakh – MACC	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Peter Burke – American Transmission Co.	Yes	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes		
Samuel W. Leach – TXU Power	Yes	Yes	
Kathleen Goodman – ISO-NE	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
SPP Transmission Working Group	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	
Consolidated Edison	Yes	Yes	

IDWG Comments:

The new NERC Standards for DME should consider important issues that came to light in the investigation of the August 14th 2003 blackout. Particularly, the standards must address the need for specificity in standardized criteria and specifications for DMEs and DDRs to ensure the ability of analyzing wide-spread events that pay no respect to political, corporate, or regional boundaries.

The blackout investigations indicated the following:

1. Although there was more recorded data available in 2003 to fully analyze the event than for any other blackout, a vast majority of recorded data was not accurately time stamped with global positioning system (GPS) signals. All of this data is vital information to minimize the effects of future blackouts. It is used to analyze misoperation of generators, or line trips, and provide data for validation of dynamic models, frequency analysis etc. and compare simulations of the event with actual real-time recordings

2. The overall result was an inordinate amount of effort and time was spent in piecing together basic information from dynamic disturbance recorders (DDRs), disturbance fault recorders (DFRs) and sequence-of-events recorders of the various NERC regions involved in the event.

3. There was a lack of continuous dynamic disturbance recorders (R1.4) at key busses and lines in the EHV system, or at large generating plants. As a result, when the system broke up into several islands, there was insufficient recording of the events for analysis of frequency, voltages, and power flows at key locations (R1.6).

4. A clear indication from the recent IDWG survey of DMEs in the various NERC regions was that :

    a. The approaches used by many of the regions were quite different. Different regions interpreted the NERC Planning Criteria and the related standards and measurements differently;

    b. Some of the regions seemed to have some difficulty in individually developing comprehensive requirements for the installation of disturbance monitoring equipment, as stated in existing criteria and in the new standard in R1;

Commenters	Reliability Need?	Acceptable Translation?	Comments

c. Certain entities could have interpreted Disturbance Fault Recorders as a proxy for Dynamic Disturbance Recorders (DDRs) for Disturbance Monitoring in meeting requirements;

d. Difficulty in interpreting capability of existing (versus new) DMEs as meeting NERC requirements;

e. Regional criteria for recommended locations and specifications of the devices appeared to be non-uniform and in some cases non-existent.

5. This could result in disturbance monitoring installations of varying description and specifications installed at different locations in an Interconnection with multiple regions such as the Eastern Interconnection, which collectively may not function adequately when a system-wide disturbance such as the August 14th 2003 blackout occurs.

6. Many disturbances, and in particular cascading outages, result in abnormal system behavior that spans the Interconnection across multiple regions. This distinctly points to a need for standardization of minimum criteria and specifications between NERC regions to facilitate analyses of wide-spread events.

7. Also, the possibility of control areas sharing data from monitoring devices located in different regions in close proximity and common data management and storage should also be considered.

8. New NERC Standards for DME should consider all these issues in providing minimum technical specifications and criteria to assist the regions in fulfilling their requirements for the installation of disturbance monitoring equipment.

The proposed standards appear to be lacking in the key areas described above for Interconnection-wide coverage for DMEs in general and DDRs in particular.

Generally, these standards have the following deficiencies

- They address only the new equipment being installed.
- They do not address adding time-synchronization capability to the existing installations.
- They do not specify the process for identifying additional locations.
- They do not specify the process for enforcing additional installations.
- They do not specify that installation of dynamic recording devices or sequence-of-event recorders is necessary to meet Disturbance Monitoring requirements.

Therefore, IDWG is developing a new set of DME SARs, which are to be completed by June 30, 2005.

Response:

The standard was significantly revised and the incorporates many of your suggestions for revisions. The revised standard:

- Establishes minimum requirements for DME equipment within a Region without any ‘grandfathering’ of existing DEM equipment

PRC-002-1 Define and Document Regional Disturbance Monitoring and Reporting

Commenters	Reliability Need?	Acceptable Translation?	Comments

- Includes requirements for time-synchronization that should make Disturbance data easier to analyze
- Requires the RRO to identify criteria for the location of DMEs, including Sequence of Event Recorders, Fault Recording equipment and Dynamic Disturbance Recording devices.

Comments on Field Testing and Effective Date:

Summary Consideration: Most commenters did not indicate a need to field test this standard. The drafting team is recommending that the effective date be January 1, 2007. This provides the RRO with time to run studies to determine where to locate Disturbance Monitoring Equipment and to formalize documentation of the reporting requirements.

Commenters	Field Test Required?	Recommended Date?	Justification
Greg Ludwicki – Northern Indiana Public Service Co.	No	11-1-06	Give a 2 year dead-band to install proper monitors due to budgeting processes.
Response: The requirements to install equipment are contained within PRC-018 and PRC-018 does include a phased-in compliance that gives entities several years to acquire needed Disturbance Monitoring Equipment.			
Peter Burke – American Transmission Co.	Yes		The activity covered by the standard has not been a routine practice within the industry.
Response: The RRO should be able to run studies and develop requirements for disturbance monitoring and reporting without field testing.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-018-1 Disturbance Monitoring Equipment Installation and Data Reporting

Pacific Gas and Electric			R1 If additional disturbance monitoring equipment is required for nuclear facilities, a two year advance notice is required for installation. M2 Refers to non-existent sections R2.1 through R2.6 in PRC 002 for data requirements.
Response: This standard is applicable to generator owners without regard to what type of generation is involved. This is a 'companion' standard to PRC-002 which requires each Regional Reliability Organization to establish requirements for the regional disturbance monitoring and reporting requirements The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements. The typographical errors have been fixed.			
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	I interpret requirement for an annual test. Recommend a longer time frame unless operational anomalies are encountered, possibly 5 years.
Response: This is not an accurate interpretation – the standard is not requiring any specific frequency for testing.			
Kansas City Power and Light	Yes	No	It appears that this standard is redundant to PRC-002-0
Response: This is a complementary standard that works with the requirements of PRC-002. PRC-002 requires that the RRO establish requirements; PRC-018 requires entities to comply with those regional requirements.			
Constellation Generation Group	Yes	No	What disturbance monitoring equipment is acceptable? Need to define synchronous requirements.
Response: PRC-002 was revised to indicate what equipment is covered by this standard. PRC-002 was revised to state more specifically the requirements for time synchronization.			
NERC Interconnection Dynamics Working	Yes	No	See comments at the end of MOD-022-1

Commenters	Reliability Need?	Acceptable Translation?	Comments
Group			
Response: PRC-002 and PRC-018 were revised to consider the comments submitted by the IDWG. See the consideration of the IDWG's comments at the end of the comments submitted on PRC-002.			
Cinod Kotecha	Yes	No	Has the intent of this Standard gone beyond the scope of the original Planning Standard IIICM8? Recommends it be remanded back into the SAR process as a new standard, and removed from this set.
Response: This is not a translation of IIICM8 – it is a translation of the IF measures.			
Kathleen Goodman – ISO-NE	Yes	No	We believe the intent of this Standard has gone beyond the scope of the original Planning Standard IIICM8 and recommends it be remanded back into the SAR process as a new standard, and removed from this set.
Response: This is not a translation of IIICM8 – it is a translation of the IF measures.			
NPCC CP9 RSWG	Yes	No	NPCC Participating members believe the intent of this Standard has bone beyond the scope of the original Planning Standard IICM8 and recommends it be remanded back into the SAR process as a new standard, and removed from this set
Response: This is not a translation of IICM8 – it is a translation of the IF measures.			
Alan Adamson – NYSRC Consolidated Edison	Yes Yes	No No	Section C, Measures, M2 references PRC-002 R2.1 through R2.6. It appears that it should be referring to PRC-018-1 instead.
Response: This typo has been corrected.			
Doug Hohbough – First Energy Corp.	Yes	No	The purpose and R3 should refer to Disturbance Monitoring Equipment data not Disturbance data. R3, M2 and M3 should refer to PRC-018 not PRC-002. The addition of time synchronization requirement is OK.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The requirement was modified to clarify what Disturbance data is being referenced.			
Joseph D Willson – PJM	No	No	Level 1 references another standard. You must not judge compliance of this standard by imposing additional requirements not contained in this standard.
Response: The cross reference to another standard was removed.			
Individual Members of CCMC	Yes	No	Level 1 references another standard. You must not judge compliance of this standard by imposing additional requirements not contained in this standard. Reference to old measurements being replaced/retired is inappropriate. Reference to other standards can cause future conflict problems as standards change and cause compliance auditing problems if referenced standard are non-compliant.
Response: The cross reference to another standard was removed.			
FRCC	Yes	No	The levels of Non-Compliance address the installation of Disturbance Monitoring Equipment at "all required locations". The requirements in PRC-002 does not specifically address "required locations". This area is indirectly addressed in R1.5 and R1.6, but it is not clear that the "all required locations" in this standard points to R1.6 of PRC-002.
Response: PRC-002 was revised to require the RRO to include criteria for the location of DMEs.			
Raj Rana – AEP	Yes	Yes	Modify Definition of Disturbance Monitoring Equipment to include Microprocessor relays.
Response: The definition was revised to indicate that Fault recorders may include protective relays.			
Barry Green – Ontario Power Generation	Yes		There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, PRC-018-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the

Commenters	Reliability Need?	Acceptable Translation?	Comments
			applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case, the appropriate entity to meet the requirements.
Response: The Functional Model is not clear as to which entity is responsible for the requirements in this standard. Because there is a financial investment associated with mitigation plans, the Drafting Team defaulted to assigning these requirements to the Generator Owner. The Generator Owner may delegate the tasks to the Generator Operator. This is similar to the way corresponding protection & control standards assign responsibilities to the Transmission Owner.			
PPL Corporation	Yes	Yes	PPL strongly supports the use of disturbance data wherever possible in lieu of requiring generator testing. Therefore, clear requirements for the installation of, and reporting from this equipment is essential. Adequate time must be granted to allow for the budgeting, engineering, and installation of this equipment where it currently does not exist.
Response: PRC-002 was revised to require the RRO to include criteria for the location of DMEs. The Regions need to specify when and where DMEs must be installed. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements.			
Michael C. Calimano – NYISO	Yes	Yes	This standard is contingent on the PRC-002-1 and should either be combined with PRC-002-1 or be tabled until adoption of PRC-002-1
Response: Yes. The implementation plan for PRC-018 will clarify that PRC-018 is dependent upon adoption and implementation of PRC-002 and will provide time for facility owners to become compliant following the implementation of PRC-002.			
WECC Reliability Subcommittee Mohan Kondragunta – Southern California Edison	Yes Yes	Yes Yes	WECC RS agrees with the time synchronization status reporting.
Response: PRC-002 was revised to add even more specificity to the requirements for time synchronization.			
John Horakh – MACC	Yes	Yes	OK to add time synchronization to complement reference in PRC-002

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: PRC-002 was revised to add even more specificity to the requirements for time synchronization.			
WECC Disturbance Monitoring Work Group	Yes	Yes	The WECC DMWG agrees that time synchronization status should be reported as part of each disturbance monitor's operational status. In addition, Requirement 2.4 should also include reporting the type of time input provisioning. Under part D Compliance, section 1.3, the DMWG recommends that the first occurrence of the word [data] be replaced with the word [information] to differentiate between information about the Disturbance Monitoring Equipment (DME) and the data that the DME collects. Also, twelve months may not be a long enough data retention period for disturbance monitor data. As mentioned in our comment on MOD-022, a complete analysis of a disturbance and subsequent model revisions could take more than two years to complete. Data should be retained for at least 12 months beyond the date the revised models are implemented in system studies or the date a determination is made that no model revisions are required.
Response: PRC-002 was revised to add even more specificity to the requirements for time synchronization. The standard was extensively revised and now includes functional requirements for time synchronization rather than 'how' to achieve time synchronization. The word 'data' in the data retention section referenced, matches the word, 'data' used in Requirement 2 in the standard. The requirement to retain data has been revised to require that the Disturbance data reported to the RRO must be kept for 3 years.			
Southern Company – Transmission	Yes	Yes	M2 has a reference to R2.1 through R2.6 of PRC-002. This should be PRC-018.
Response: This has been corrected.			
NERC System Protection and Controls Task Force Tennessee Valley	Yes Yes	Yes Yes	R.2 should be revised to read: The Transmission Owner and Generator Owner shall maintain, and report to the Regional Reliability Organization within 30 calendar days of a request, the following data on its installed Disturbance Monitoring

Commenters	Reliability Need?	Acceptable Translation?	Comments
Authority			
Response: PRC-002 requires that the RRO's request for data include a timetable for responding to the request, so this suggestion was not adopted.			
Mark Kuras – MAAC	Yes	Yes	Recommed a numbered sublist for the Levels of non-compliance instead of the present paragraph format.
Response: The levels of non-compliance were extensively revised.			
IESO – Ontario	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
SPP Transmission Working Group	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Gerald Rheault – Manitoba Hydro	Yes	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	
Midwest Reliability Organization	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Ed Riley – California ISO	Yes	Yes	
Southern Company Generation	Yes	Yes	
ISO/RTO Council Standards Review Committee	Yes	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Entergy	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Xcel Energy – Northern States Power	Yes	Yes	
SERC EC Generation Subcommittee (GS)	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Peter Burke – American Transmission Co.	Yes	Yes	
Samuel W. Leach – TXU Power	Yes	Yes	
Gred Mason – Dynergy Generation	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: Most commenters did not indicate a need to field test this standard. The drafting team is recommending that the effective date be phased in over several years to give facility owners time to purchase and install needed equipment. The requirements associated with installing equipment are phased in from April 1, 2008 through April 1, 2011. Requirements associated with providing disturbance data and providing information about disturbance monitoring equipment are recommended to become effective on October 1, 2007.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		Transmission Owners and Generator Owners need time to become compliant with new requirements being developed in PRC-002-1. Additional expense and testing may be required to comply with RRO requirements in PRC-002-1.
Response: Agree. PRC-018 does include a phased-in compliance that gives entities several years to acquire needed Disturbance Monitoring Equipment.			
Peter Burke – American Transmission Co.	Yes		The activity covered by the standard has not been a routine practice within the industry. Further this standard is dependent on successful implementation of PRC-002
Response: Most commenters did not indicate a need to field test this standard.			

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments

MOD-022-1 Use of Disturbance Data to Develop and Maintain Models

Summary Consideration:
Many stakeholders indicated that the requirements are too subjective and cannot be standardized until practical methods are developed. The drafting team recommends removing this standard from the set of Phase III & IV Standards moving forward for further development. The Planning Committee may choose to use the initial draft of the standard and the associated comments as the starting point for a Planning Guide on the use of disturbance data in modeling. This shall serve as a response to all comments submitted suggesting changes to the first draft of MOD-022-1.

FRCC	No	No	This proposed standard should be deleted. Event re-creation is a very time-consuming and complex task that the RRO should undertake as needed, but should not be a reliability standard. The RROs should be given discretion in selecting disturbances to be studied and in interpreting the study results.
AEP			Drop/delete this standard. The proposed standard covers an area where difficulties will be encountered in enforcing the requirements. This is because of the often complex modeling problems and significant engineering time involved in replicating system disturbances and determining the most appropriate modeling enhancements to achieve reasonable matches between disturbance data and simulation results. Not every disturbance is worthy of an event replication effort, which could consume significant resources. Compliance enforcement problems would arise when disturbances are not adequately recorded, do not fit well within the time frame of model applicability, are too localized in nature, or are otherwise not worthy of the time and expense to replicate. -- It may not always be desirable to include all improvements in system data necessary to replicate a given disturbance into general purpose planning base cases. There must be allowance to exercise judgment in this regard. Where it makes sense to include model changes into base case data, this should be done with review at the Regional level to help ensure that future problems with the data do not arise. These are some of the reasons for recommending against proceeding with this standard. However, if NERC still wishes to proceed, the standard should emphasize the reporting of disturbance replication analysis, with less emphasis on the inclusion of model changes identified by a particular disturbance replication. The Compliance Monitoring Period should be extended from one to at least five years in order to allow opportunity for more disturbances to be factored into decisions on any modeling data changes, and allow sufficient time to analyze such disturbances.

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments
Raj Rana – AEP	No		Drop/delete this standard. For details see AEP comment.
Tennessee Valley Authority	No	No	Proposed standard does not take into account the significant time involved and the complexity of issues in the investigation and modeling of system disturbances and determining the most appropriate modeling enhancements to correlate simulation results with recorded data. Every recorded event should not be used for model validation because of the number of events that are recorded. This standard, as written, would take an excessive amount of manpower commitment! The standard needs to allow engineering judgment as to which disturbances should be modeled. Also unintended compliance problems would arise when disturbances are not adequately recorded or are too localized in nature to justify the time and expense to investigate and simulate accurately. Although this standard sounds like a good idea, engineering judgment is difficult to audit, therefore the standard should be transformed into a guide or deleted. This really is a guide not a reliability standard.
Mark Kuras – MAAC	No	No	This well-intentioned standard should be deleted, because the extent of engineering judgment which must be used to determine which disturbances need to be simulated, what results should be retained for general use, and the methods to be used cannot be objectively audited for compliance. We recommend that this information be retained as a guide. The proposed standard belittles the often complex issues and significant time involved in replicating system disturbances and determining the most appropriate modeling enhancements to achieve reasonable matches. Simulation and analysis of every recorded disturbance should not be required, and not every analysis will provide useful data for model validation. Exercise of judgment to determine which disturbances are worthy of an event replication effort must be allowed. Regions and transmission owners need to set priorities because of the volume of events that may be recorded. Because these points are not recognized by the standard as written, it would mandate an excessive manpower commitment. There must be allowance to exercise judgment in this regard.
Multi-Regional Modeling Working Group	No	No	This well-intentioned standard should be deleted, because the extent of engineering judgment which must be used to determine which disturbances need to be simulated, what results should be retained for general use, and the methods to be used cannot be objectively audited for compliance. We recommend that this information be retained as a guide. The proposed standard belittles the often complex issues and significant time involved in replicating system disturbances and determining the most appropriate modeling enhancements to achieve reasonable matches. Simulation and analysis of every recorded disturbance should not be required, and not every analysis will provide useful data for model

Commenters	Reliability Need?	Acceptable Translation?	Comments
			validation. Exercise of judgment to determine which disturbances are worthy of an event replication effort must be allowed. Regions and transmission owners may need to set priorities because of the volume of events that may be recorded. Because these points are not recognized by the standard as written, it would mandate an excessive manpower commitment. Furthermore, unintended compliance problems may arise when disturbances are either not adequately recorded or are too localized in nature to justify the time and expense to replicate. Where model changes are identified and it appears appropriate to include them in base case data, there should be review at the Regional level to insure that problems are not created for simulation of other future events. It may not always be desirable to include all improvements in system data necessary to replicate a given disturbance into general purpose base cases. There must be allowance to exercise judgment in this regard.
Gerald Rheault – Manitoba Hydro	No	No	The use of disturbance data to enhance system models is good practice but Manitoba Hydro does not believe that it should be mandated as a Standard. The RRO should reference this practice in its regional procedures allowing for judgement to determine which disturbances are worthy of being replicated in the modelling effort. Measure M1: Clarify if such evidence is required for every disturbance recorded. It should be sufficient to validate models using a few major disturbances from time to time. The standards should specify how often such validation is required. 1.3 Data retension: Wording is confusing - disturbance data is not applied to the models, but used to validate model performance. What is meant by "updates"? This Standard would be difficult for the compliance team to monitor. Therefore Manitoba Hydro recommends it be deleted from Phase III-IV Standards.
John K. Loftis, Jr. – Dominion – Electric Transmission	No	No	This standard should be deleted. The idea of using disturbance data to develop models works on paper, and in theory only. In practice, to replicate an event is a major, time consuming effort. It requires several days of work just to get a power flow solution that would reasonably match field observed quantities, and much more time for a dynamics assessment. Even then, the question of which events should be considered worthy of replication for modeling purposes remains. Also, lack of proper load characteristics to a reasonable degree for different types of load may throw the comparison into a tail-spin. The question whether the difference between field results and simulation results is due to load characteristics (or some other aspect of the power system) or generator equipment modeling inaccuracies will remain. If one tries to fit generator equipment models to match field observed quantities under a single operating condition, it may not always match for a

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments
			different operating condition unless generator equipment modeling is the only cause of the mismatch. The current industry environment (i.e. - deregulation, blackout follow-up investigations, etc.) have placed increasingly burdensome workloads on limited field expertise. MOD-022 detracts from more important work needed to address improved reliability.
Midwest Reliability Organization	No	No	Incorrect reference to PRC-002. References R3.1 and R3.2. Intent is to refer to PRC-002-1 R1? This standard provides some good guidelines for utilizing disturbance data to maintain system models. However, this standard should not be mandated to the transmission planner or planning authority level. This should be done at the Regional level. In addition, there should be room for judgement at the regional level when determining which disturbances are worthy of an event replication effort. Recommend that this standard be deleted.
ISO/RTO Council Standards Review Committee	Yes and No	Yes and No	This standard needs specifity and some reasonable bounds to expectations. It may be best to delete this standard and develop the concepts in a reference document. Replicating system disturbances is a complex and resource intensive pprocess. The validation of system models based on the inclusion of all system distrubances seems overly burdensome and may be impractical. The word "all" is too broad a scope and needs to be better defined. These requirements may be better suited as guides in the future.
Consolidated Edison Alan Adamson – NYSRC Cinod Kotecha Kathleen Goodman – ISO-NE NPCC CP9 RSWG	 No No No	No No No No No	Suggested change to R1: Specify the type of disturbances which are required to validate models. Also change: "..to develop, maintain, and enhance steady-state and dynamic models." To "..to enhance analysis of wide area system disturbances and validate system simulation models. In addition this may be more appropriate to be a Guide rather than a Standard as the inclusion of all system disturbances in the validation of system models seems onerous and unmeasurable.

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments
Joseph D Willson – PJM	No	No	Levels of non-compliance add additional requirements not contained in the requirements section of this standard. The levels of non-compliance are difficult (and therefore subjective) to measure Remove 30 days from M1 This is a data gathering set of requirements and should not be a compliance program concern.
Individual Members of CCMC	Yes	No	Levels of non-compliance add additional requirements not contained in the requirements section of this standard. Need to improve requirements. The levels of non-compliance are difficult (and therefore subjective) to measure. As written, it is too vague to be effective. Need more specification on what information is to be used and how evidence of use can be established. Remove 30 days from M1 and move to requirements. This is a data gathering set of requirements and should not be a compliance program concern. As written, it is too vague to be effective. Need more specification on what information is to be used and how evidence of use can be established. Do not reference requirements from other standards as they are likely to change and may conflict with this standard. Also if the referenced standard is judged non-compliant, how can this standard be checked for compliance.
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	The Planning Authority and Transmission Planner shall retain distrubance simulation results and updates.....periods. This does not seem clear could it be clearified and simplified by saying that the disturbance data should be retained.
Michael C. Calimano – NYISO	Yes	No	Change; "..to develop, maintain, and enhance steady-state and dynamic models." To "..to enhance analysis of wide area system disturbances and validate system simulation models. The industry needs to develop widely accepted programs to implement the intent of the requirements of this standard.

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Commenters	Reliability Need?	Acceptable Translation?	Comments
P.D. Henderson Khaqan Khan	Yes	No	This standard needs specifity and some reasonable bounds to expectations. Replicating system disturbances is a complex and resource intensive process. The validation of system models based on the inclusion of "all" system disturbances seems overly burdensome and may be impractical. These requirements should be based on a representative sample of reportable incidents. Another option is that R1 should specify the notable type of disturbances which are required to validate models. Also change; "..to develop, maintain, and enhance steady-state and dynamic models." To "..to enhance analysis of wide area system disturbances and validate system simulation models.
Kansas City Power and Light	Yes	No	The requirements appear to be addressed in MOD-013-0 and PRC-002-1. The types of qualifying disturbances needs to be defined.
SPP Transmission Working Group	Yes	No	Defination of DISTURBANCE is too broad. Need a list of qualifying disturbances. Type of models, or component that needs to be validated should be identified.
Doug Hohbough – First Energy Corp.	Yes	No	The definition should be revised slightly to conform more closely to the IEEE definition: Disturbance Monitoring Equipment - General name for non-continuous power system recording equipment, which includes fault recorders, disturbance recorders, and sequence of events recorders. All references to updating dynamic models should be removed. This process is not being widely practiced in the industry and cannot be properly used to update all dynamic data. Dynamic models are better verified using staged tests where conditions are controlled and specific monitoring is in place. Section 1.3 on Data Retention should be revised to: The Planning Authority and Transmission Planner shall retain disturbance data records and study results that verified or resulted in updates to steady-state models. Section 1.3 previously required retaining simulation results and updates that resulted. However, updates to mature electrical systems are very infrequent as the majority of the electrical system has not changed and system events have previously been used to verifiy system impedances. As written the standard presumes that the system models are

Commenters	Reliability Need?	Acceptable Translation?	Comments
			extremely flawed and require frequent corrections which may not be the case.
Entergy SERC EC Planning Standards Subcommittee (PSS) Southern Company – Transmission	Yes Yes Yes	No No Yes	This standard is written from the viewpoint that all data from Disturbance Monitoring Equipment is useful in enhancing models. Some data is useful and some is not. This standard needs major wording changes as follows: Purpose: To use recorded disturbance data when appropriate in an attempt to validate and enhance system models. R1. The Planning Authority and Transmission Planner shall each use any appropriate recorded data from Disturbance Monitoring Equipment as required in PRC-002 R3.1 and PRC-002 R3.2 to validate and enhance steady-state and dynamic models. M1. The Planning Authority and Transmission Planner shall each provide evidence that if any useful recorded disturbance data was obtained, it was used to assess its steady state and dynamic models. This evidence shall be provided to the Regional Reliability Organization within 30 calendar days of a request. 2.2. Level 2: Useful, available recorded data…… 2.4. Level 4: Useful, available recorded data……
John Horakh – MACC	Yes	No	Standard MOD-022-1 — Use of Disturbance Data to ~~Develop and~~ Maintain Models Draft: April 21, 2005 Page 3 of 4 Proposed Effective Date:November 1, 2005 A. Introduction 1. Title: Use of Disturbance Data to ~~Develop and~~ Maintain Models 2. Number: MOD-022-1 3. Purpose: To ensure that system models remain current by using recorded disturbance data. 4. Applicability 4.1. Planning Authority 4.2. Transmission Planner 5. Proposed Effective Date: November 1, 2005

Commenters	Reliability Need?	Acceptable Translation?	Comments
			B. Requirements R1. The Planning Authority and Transmission Planner shall each use recorded data from Disturbance Monitoring Equipment as required in PRC-002 R3.1 and PRC-002 R3.2 to ~~develop,~~ maintain, ~~and enhance~~ steady-state and dynamic models. Recorded data shall be compared to results from model simulations of the same conditions. Needed model changes shall be identified and incorporated in the models. C. Measures M1. The Planning Authority and Transmission Planner shall each provide evidence that recorded disturbance data was used to ~~assess~~ maintain its steady state and dynamic models. Evidence shall be provided that recorded data was compared to results from model simulations of the same conditions, and that needed model changes were identified and incorporated in the models. This evidence shall be provided to the Regional Reliability Organization within 30 calendar days of a request. D. Compliance 1. Compliance Monitoring Process 1.1. Compliance Monitoring Responsibility Regional Reliability Organization 1.2. Compliance Monitoring Period and Reset Timeframe One calendar year 1.3. Data Retention The Planning Authority and Transmission Planner shall retain disturbance simulation results and any ~~updates~~ changes they applied to steady-state and dynamic models as a result of those simulations for the current and last model update periods. The Compliance Monitor shall retain any audit data for three years. 1.4. Additional Compliance Information The Planning Authority and Transmission Planner shall demonstrate compliance through

Commenters	Reliability Need?	Acceptable Translation?	Comments
			the following method, as determined by the Compliance Monitor - self certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event). 2. Levels of Non-Compliance 2.1. Level 1: Not applicable 2.2. Level 2: Available recorded data from Disturbance Monitoring Equipment of system disturbances that occurred since the most recent model update was ~~used in~~ compared with results from steady state and/or dynamic simulations of the same conditions, but needed model changes identified by the simulations were not incorporated in steady-state and/or dynamic models. 2.3. Level 3: Not applicable 2.4. Level 4: Available recorded data from Disturbance Monitoring Equipment of system disturbances that occurred since the most recent model update was not ~~used in~~ compared with results from steady state and/or dynamic simulations of the same conditions.
NERC Interconnection Dynamics Working Group	Yes	No	The new NERC Standards for DME should consider important issues that came to light in the investigation of the August 14th 2003 blackout. Particularly, the standards must address the need for specificity in standardized criteria and specifications for DMEs and DDRs to ensure the ability of analyzing wide-spread events that pay no respect to political, corporate, or regional boundaries. The blackout investigations indicated the following: 1. Although there was more recorded data available in 2003 to fully analyze the event than for any other blackout, a vast majority of recorded data was not accurately time stamped with global positioning system (GPS) signals. All of this data is vital information to minimize the effects of future blackouts. It is used to analyze misoperation of generators, or line trips, and provide data for validation of dynamic models, frequency analysis etc. and compare simulations of the event with actual real-time recordings 2. The overall result was an inordinate amount of effort and time was spent in piecing together basic information from dynamic disturbance recorders (DDRs), disturbance fault recorders (DFRs) and sequence-of-events recorders of the various NERC regions involved in the event. 3. There was a lack of continuous dynamic disturbance recorders (R1.4) at key busses and lines in the EHV system, or at large generating plants. As a result, when the system broke

Commenters	Reliability Need?	Acceptable Translation?	Comments
			up into several islands, there was insufficient recording of the events for analysis of frequency, voltages, and power flows at key locations (R1.6). 4. A clear indication from the recent IDWG survey of DMEs in the various NERC regions was that : a. The approaches used by many of the regions were quite different. Different regions interpreted the NERC Planning Criteria and the related standards and measurements differently; b. Some of the regions seemed to have some difficulty in individually developing comprehensive requirements for the installation of disturbance monitoring equipment, as stated in existing criteria and in the new standard in R1; c. Certain entities could have interpreted Disturbance Fault Recorders as a proxy for Dynamic Disturbance Recorders (DDRs) for Disturbance Monitoring in meeting requirements; d. Difficulty in interpreting capability of existing (versus new) DMEs as meeting NERC requirements; e. Regional criteria for recommended locations and specifications of the devices appeared to be non-uniform and in some cases non-existent. 5. This could result in disturbance monitoring installations of varying description and specifications installed at different locations in an Interconnection with multiple regions such as the Eastern Interconnection, which collectively may not function adequately when a system-wide disturbance such as the August 14th 2003 blackout occurs. 6. Many disturbances, and in particular cascading outages, result in abnormal system behavior that spans the Interconnection across multiple regions. This distinctly points to a need for standardization of minimum criteria and specifications between NERC regions to facilitate analyses of wide-spread events. 7. Also, the possibility of control areas sharing data from monitoring devices located in different regions in close proximity and common data management and storage should also be considered. 8. New NERC Standards for DME should consider all these issues in providing minimum technical specifications and criteria to assist the regions in fulfilling their requirements for the installation of disturbance monitoring equipment. The proposed standards appear to be lacking in the key areas described above for

Commenters	Reliability Need?	Acceptable Translation?	Comments
			Interconnection-wide coverage for DMEs in general and DDRs in particular. Generally, these standards have the following deficiencies • They address only the new equipment being installed. • They do not address adding time-synchronization capability to the existing installations. • They do not specify the process for identifying additional locations. • They do not specify the process for enforcing additional installations. • They do not specify that installation of dynamic recording devices or sequence-of-event recorders is necessary to meet Disturbance Monitoring requirements. Therefore, IDWG is developing a new set of DME SARs, which are to be completed by June 30, 2005.
Peter Burke – American Transmission Co.	Yes	No	While we agree that this standard has a reliability need, its intended purpose would not be met until the following deficiencies in the existing translation are addressed: (A) it requires the TP/PA to improve the models in an MMWG simulation case using recorded disturbance data --- however, such an activity requires coordination between TOs/GOs/TPs/PAs in a Region and, therefore, should more appropriately be accomplished at the RRO level (as is practiced in WECC); (B) it requires TP/PA to improve the dynamic modeling data based on simulation/recording comparison..... but dynamic models and associated data for generators/exciters/governors are provided by GO's, and any dynamic load representation would be provided by LDC's --- so there is little dynamic model updating that can be done autonomously by the TP/PA, unless the RRO coordinates such activity. (C) Defining the threshold of significant disturbance that merits model validation efforts is difficult to prescribe in a standard, and should be at the discretion of the RRO. (D) DME output data and an MMWG model are insufficient inputs to validate a model. Pre- and post-disturbance models that reasonably represent the actual system topology are necessary. Expectations to ensure such models are available should be included in the standard.
Pacific Gas and Electric			Add a requirement, R2, to obtain postulated post accident offsite power loading from the nuclear power plants.

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments
WECC Disturbance Monitoring Work Group	Yes	Yes	The levels of non-compliance do not specify a timeframe for using the disturbance data and for revising or updating the models. In some cases, it can take more than a year to capture and debug the disturbance data, develop the system model base cases, and determine if the system models need revision. If the models need to be revised, the revison process can take up to another year to complete. Without a time frame for completion specified, a Transmission Planner or Planning Authority could be found non-compliant even if they are diligently revising their models at the time they are audited.
Ed Riley – California ISO	Yes	Yes	The requiement to use "all" disturbance data to develop and maintain models may be to large of a task. Some methodology of determining which disturbance data must be considered should be developed.
Southern Company Generation	Yes	Yes	Recommend the SDT make mention of a procedure with the TP and PA that will define the criteria for selecting which disturbances will be analyzed.
Karl A. Bryan - US Army Corps of Engineers	Yes	Yes	This standard makes the verification of generator model data easier for the generator owner as well as economically feasible. The cost for retesting is hard to justify when very little equipment changes have occurred on your system.
PPL Corporation	Yes	Yes	PPL strongly supports the use of disturbance data wherever possible in lieu of requiring generator testing.
Transmission Issues Subcommittee	Yes		TIS requests that MOD-022 clarify what disturbances trigger the requriment for the PA or TP to validate models using recorded data.
Xcel Energy – Northern States Pwr	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Dan Griffiths – PA Office of Consumer Adv	Yes	Yes	

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Commenters	Reliability Need?	Acceptable Translation?	Comments
Howard Rulf - WE Energies	Yes	Yes	
WECC Reliability Subcommittee	Yes	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
Gred Mason – Dynergy Generation	Yes	Yes	
Mohan Kondragunta – So CA Edison	Yes	Yes	

MOD-022 Use of Disturbance Data to Develop and Maintain Models

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team recommends MOD-022 be dropped from the set of Phase III & IV standards being developed because commenters indicated that there aren't established, practical methods in place to meet the proposed requirements. This summary consideration shall serve as a response to all comments submitted on this question.

Commenters	Field Test Required?	Recommended Date?	Justification
Peter Burke – American Transmission Co.	Yes		The activity covered by the standard has not been a routine practice within the industry.
Tennessee Valley Authority	Yes		This standard, as written, would take an excessive amount of manpower commitment. Every recorded event should not be used for model validation because of the number of events that are recorded.
Xcel Energy – Northern States Power	Yes	1/2007	At present, there is no industry-wide accepted criteria established to perform this function, and consensus on process should be reached prior to implementation of this standard. Based on end-of- year acceptance of this standard by the NERC BOT, time should be given to the various planning bodies affected to coordinate the infrastructue required to meet this standard.

Commenters	Reliability Need?	Acceptable Translation?	Comments

MOD-023-1 Procedures for Verifying Generation Equipment Data

Summary Consideration:

There were many suggestions for modifying the sequence of standards that include MOD-023 through MOD-027. MOD-023 required the RRO to develop procedures requiring Generator Owners to verify the following types of data used in modeling and for real-time analyses:

- Generator gross and net real power capability
- Generator gross and net reactive power capability
- Excitation system models and related data
- Speed/load governor control models and data

There were four companion standards:

- MOD-024 requires the Generator Owner to verify (and report to end users) its generator gross and net real power capability
- MOD-025 requires the Generator Owner to verify (and report to end users) its generator gross and net reactive power capability
- MOD-026 requires the Generator Owner to verify its excitation system models and related data
- MOD-027 requires the Generator Owner to verify its speed/load governor control models and data

To prepare the second draft of this set of standards, the Drafting Team subdivided the requirements in MOD-023 and placed the RRO's requirement to write procedures, and forward those procedures to the Generator Owners, into each of the standards that required the Generator Owner to verify and provide models and data (MOD-024 through MOD-027). The Drafting Team will ask the industry if it supports this change. One of the reasons the drafting team made this change was to make the balloting easier and to ensure that field testing of some measures won't hold up the entire sequence of standards.

Gred Mason – Dynergy Generation	(From Q 4 – Other comments) All of MOD-023-1 seems largely redundant to MOD-013-0.Suggest deleting MOD-013-0

Response: MOD-013 addresses reporting of data and what types of data need to be reported. MOD-023 focuses more specifically on verification of data for generator equipment.

IESO	(From Q 4 – Other comments) Most models should be validated by tests. Where available, we suggest the use of standard test procedures (e.g. IEEE 115). We suggest the following additions to the "data verification parameters to be reported" requirement:

Commenters	Reliability Need?	Acceptable Translation?	Comments
			- generator impedances - time constants - saturation coefficients - inertia Response: The RRO may require models be validated by tests or elect to refer to an IEEE standard, but these are not universal requirements across all interconnections and regions. Some regions may have alternative methods to verify models. These additional items are addressed as reporting requirements in MOD-013 and would remain constant over the life of the equipment (unless there is a major rebuild). The drafting team does not believe it is appropriate to add these items for verification.
PPL Corporation			(From Q 4 – Other comments) The Regional Reliability Organization needs to determine the frequency and overall criteria required for any generation testing in support of these new standards. The needs basis shall only evaluate units that have a significant affect on the safe and reliable operation of the transmission system. Any test that is required on generator equipment needs to be subject to a risk analysis where the value of the test is evaluated against the risk that such test would impact the generation equipment and transmission system. Only units or stations that have a significant affect on the system should be tested. Nuclear units should be exempted from on-line testing unless the Nuclear Generator Owner can demonstrate through the 10CFR50.59 screening process that such testing is not an Unreviewed Safety Question (USQ). PPL believes that real-time operational data could be used in lieu of on-line testing in some instances to validate the range of reactive capabilities. Response: The drafting team agrees. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data. The commenter is encouraged to offer assistance in developing the regional procedures.
SPP Transmission Working Group			(From Q 4 – Other comments) MOD-023 thru 027 should include planning authorities.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			Response: The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures (MOD-023) as well as the data from the Generator Owner (MOD-024 through MOD-027) The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures as well as the data from the Generator Owner.
Pacific Gas and Electric			There needs to be a formal communication path developed between gen owner, Utility, ISO's & regions such that information can be transmitted and get to the right people. Nuclear facilities may have some exemptions as discussed in R1.1, for example 1: Any testing to verify/validate generator modeling needs to be proceduralized and a 10CFR50.59 performed. Nuclear facilities will not perform any test which is outside the design/license basis of the plant or may adversely impact the health and safety of the public. Example 2: Our facility is on a 20-22 month fuel cycle and should not be required to do testing requiring taking the unit offline at a frequency less than one refueling cycle.
			Response: The reporting and communications requirements should be addressed by the procedure developed pursuant to MOD-013. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data. The commenter is encouraged to offer assistance in developing the regional procedures.
Karl Kohlrus - City Water, Light & Power	No	Yes	Testing of voltage regulator controls, speed/load governor controls and excitation systems is new and should be field tested.
			Response: This comment will be considered in the development of the effective date and implementation schedule.
Kansas City Power and Light	Yes	No	It appears that these requirements are addressed in standards MOD-010 through MOD-013. R2 and M2 should include the Planning Authority
			Response: MOD-010 to 013 address reporting of data and what types of data need to be reported. MOD-023 focuses more specifically on verification of data for generator equipment. The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	I interpret requirement for an annual test. Recommend a longer time frame unless operational anomalies are encountered.
Response: There is no requirement stated for an annual test. The annual reset period for monitoring compliance should not be interpreted as a testing periodicity requirement. The RRO procedure will identify the appropriate periodicity for data validation.			
SPP Generation Working Group	Yes	No	SPP is dedicated to having a reliable electric system. We understand and appreciate the importance of having accurate date in models to achieve this goal. The goal of testing should be to provide valid generating data to be used in the model. However we don't want to be required to perform any testing that would threaten the reliability of the system, potentially damage generators or where significant cost would be incurred without the addition of valued data. Each of these tests cost money, whether performed in-house personnel or outsourced, so we want to make sure we really gain data whose value is appropriate to the cost of the test.
Response: The drafting team agrees. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The commenter is encouraged to offer assistance in developing the regional procedures.			
SPP Transmission Working Group	Yes	No	Should have R1.5 should have verification documentation requirement, as asked for in MOD-24-27. R2 & R3 should include the Planning Authority. Refer to Functional Model, Planning Authority, 1c.
Response: The drafting team does not understand the first part of the comment. The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures (MOD-023) as well as the data from the Generator Owner (MOD-024 through MOD-027) The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures as well as the data from the Generator Owner.			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	R2 should include the Planning Authority, refer to Functional Model, Planning Authority, 1C.
Response: The drafting team agrees and has made this correction. The drafting team added the Planning Authority to the list of entities that will			

Commenters	Reliability Need?	Acceptable Translation?	Comments
receive a copy of the RRO's procedures as well as the data from the Generator Owner.			
Wing Joe- BC Hydro	No Answer	No	Many standards refer to this one thus this standard should be finalized and available at least 6 months or more prior to earlier than those that depend on it. In fact, it is unreasonable to expect one to accept standards (eg MOD-024-1) that commit them to an open ended , yet to be determined standard, (eg MOD-23-1).
Response: This comment will be considered in the development of the effective date and implementation schedule. Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. This change eliminates the interdependencies between this set of standards and should make implementation easier.			
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	No	MOD-023-0 is a standard from which other standards flow. As such it should be broader in nature allowing for the individual standards to be more specific. I am concerned that '..testing' as used in requirement R1.2 will be interpreted as the answer in all cases. To accept MOD-023-1, I require '..testing' to be changed to '..testing when practical'.
Response: Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. Each Region may develop procedures that contain more details than required by these standards. Testing is one alternative. The RRO will determine the verification methods based on reliability need and risk factors. The standard states that testing is one acceptable method, but not the only acceptable method.			
Gred Mason – Dynergy Generation	Yes	No	1.Generation Owners should be added to Section 4,Applicability 2.SectionB,R1 should be modified to read as follows:"…The Regional Reliability Organization shall,in coordination with Generation Owners,establish…"Regions should be required to involve Generation Owners when establishing the required procedures.
Response: The requirements in MOD-023 refer only to the development of the regional procedure. Generator owner requirements are addressed in subsequent standards on data verification. The commenter is encouraged to offer assistance in developing the regional procedures.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
ISO/RTO Council Standards Review Committee Ed Riley – California ISO	Yes Yes	No No	R1 requires the RRO to establish procedures that require generator owners to provide certain information. These procedures should include all the requirements included in MOD-024-1 and MOD-025-1 that apply to generator owners, that in some cases are more specific than now shown in MOD-023-1. In R1.4.2 "gross and net reactive power capability" should be defined.
Response: Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. With this change, the differences in levels of specificity have been eliminated. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			
IESO – Ontario	Yes	No	As we commented in the Facility ratings SAR's, there is a need for standards that depicts a "methodology". In this and other MOD standards, there needs to be an addition of requirement to use the data, methods etc to actually implement model updates - several MODs just ask for an assessment, or retention of data etc only. There also needs to be some checks and penalties for providing inaccurate capabilities. R1 requires the RRO to establish procedures that require generator owners to provide certain information. These procedures should include all the requirements included in MOD-024-1 and MOD-025-1 that apply to generator owners, that in some cases are more specific than now shown in MOD-023-1. A reference of requirements related to MOD-024 & 025 may be added in R1. R1.2, change; "Acceptable methods.." to "Guidelines for methodology.." In R1.4.2 we request the drafting team to define "gross and net reactive power capability".
Response: In this case, the 'method' is defined by the RRO in the procedure required in MOD-023. It is not practical at this time to expect a single, uniform method for validating generator equipment data across North America. Requirements to use the data are included in other standards, including existing Version 0 standards. Requirements for generators to provide accurate data are defined in MOD-024 to 027. The RRO will monitor compliance with its regional data			

Commenters	Reliability Need?	Acceptable Translation?	Comments
validation and reporting procedures. Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. This change eliminates the interdependencies between this set of standards and should make implementation easier. The RRO is to state what are acceptable methods. This is different than a guideline. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			
Consolidated Edison Alan Adamson – NYSRC Cinod Kotecha Kathleen Goodman – ISO-NE NPCC CP9 RSWG NERC Interconnection Dynamics Working Group	Yes Yes Yes Yes Yes	No No No No No No	R1 requires the RRO to establish procedures that require generator owners to provide certain information. These procedures should include all the requirements included in MOD-024-1 and MOD-025-1 that apply to generator owners, that in some cases are more specific than now shown in MOD-023-1. R1.2, change: "Acceptable methods.." to "Guidelines for methodology.." In R1.4.2 we request the drafting team to define "gross and net reactive power capability".
Response: Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. This change eliminates the interdependencies between this set of standards and should make implementation easier. The RRO is to state what are acceptable methods. This is different than a guideline. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Mark Kuras – MAAC	Yes	No	R 1.2 should add …use of… before …manufacturer data…. Measurement 3 is redundant with Measurement 1 and should be deleted. The only adequate way to verify governor and excitation systems, including voltage regulator controls, limiters, compensators, and power system stabilizers, is testing. The term …verify… is too vague; therefore I propose to change …verify… or …verification… to …test or otherwise demonstrate… throughout the standard.
Response: Agreed – added 'use of'. The drafting team agrees and has removed the redundant requirement and measure. The drafting team disagrees that testing is the only method to verify governor and excitation systems. Some elements of testing may be required, but testing is not the sole method for data validation.			
Gerald Rheault – Manitoba Hydro	Yes	No	Manitoba Hydro believes that generating units should be tested periodically to ensure that the data used in dynamic models is accurate. The frequency of testing should be established by the RRO. The wording in R1.2 should be modified to reflect this intent. R1.4.2: Should identify unit transformer tap range limitatations, if any on the capability. Add a R1.4.5 on requirement to coordinate generator protection settings to ensure units do not trip off within normal control operating range. Suggest adding a R1.5: Frequency of testing every five years. R2: A requirement should be added on the RRO to indicate how a revision to the procedures may impact the generators already tested. Add clarification that these requirements also apply to refurbished units.
Response: The drafting team agrees that testing can be one method for data validation – regional data validation methods and periodicity are to be established in the RRO's procedures. The standard addresses methods to verify reactive capability with a unit transformer tap setting in use; not to verify capabilities under all tap settings for the purpose of optimizing tap settings. Unit transformer taps are not frequently changed. Requirement to coordinate generator protection settings is covered in PRC-019. Whether or not testing is required and the periodicity are to be defined in the RRO's procedures. The effect of a revision to the procedure is presumed to be addressed within the RRO procedure itself. This is a logical question that should be			

Commenters	Reliability Need?	Acceptable Translation?	Comments
addressed in developing the revision and planning the implementation. The procedure is expected to include all generators except those identified as exempt based on factors (e.g. size) to be identified in each RRO's procedures. The status of refurbished units could be addressed under this requirement, as appropriate.			
Raj Rana – AEP	Yes and No	Yes	Reword R1.2 as follows: Acceptable methods for model and data verification, including but not limited to manufacturer data, performance tracking, simulation, analysis, field verification of equipment settings, field testing and comparison with disturbance monitoring data. Add R1.5: Any field changes made by the Generation Owner or Generator Operator to the verified data described in R1.4 above shall be re-verified / tested as soon as possible. Such changes, and their associated verification/testing results, shall be coordinated with the Transmission Owner, Planning Authority, and Transmission Planners, and reported to the region within 30 days.
Response: The drafting team agrees these are valid methods for data verification, but believes these are covered under the broader terms already provided.. The second comment addresses details that should be addressed in the RRO procedure, not in a North American standard. The commenter is encouraged to offer assistance in developing the regional procedures.			
Multi-Regional Modeling Working Group	Yes	No	R 1.2 should add …use of… before …manufacturer data…. Measurement 3 is redundant with Measurement 1 and should be deleted. The only adequate way to verify governor and excitation systems, including voltage regulator controls, limiters, compensators, and power system stabilizers, is testing. The term …verify… is too vague; therefore we propose to change …verify… or …verification… to …test or otherwise demonstrate… throughout the standard.
Response: Response: Agreed – added 'use of'. The drafting team agrees and has removed the redundant requirement and measure. The drafting team disagrees that testing is the only method to verify governor and excitation systems. Some elements of testing may be required, but testing is not the sole method for data validation. The RRO's procedures should define testing required to meet regional reliability needs.			
Peter Burke – American	Yes	No	We do not agree that all the model and data verification methods listed in R1.2 are acceptable options for each class of generation equipment parameters listed in R1.4.1 thru R1.4.4. As a Transmission Operator and Transmission Planner responsible for bulk electric

Commenters	Reliability Need?	Acceptable Translation?	Comments
Transmission Co.			system reliability, we consider Testing and Performance Tracking to be the only acceptable verification methods to demonstrate the actual real and reactive power capability (R1.4.1 and R1.4.2) of a generator. Note that in MAIN region the generators are required to test their reactive capability at least every 5 years "to demonstrate that the actual operating reactive capability of each generating unit and synchronous condenser is consistent with the modeling used in planning and operating studies." For R.1.4.3 and R.1.4.4 (governor controls and excitation systems modeling data), we advocate testing, performance tracking and manufacturer's data as preferred verification methods, which could be supplemented with simulation and analysis, when necessary.
Response: Based on industry comment, the drafting team does not agree that testing and performance tracking are the only methods for data validation. Methods should be appropriate to the reliability need, risk factors, cost factors, etc.			
Individual Members of CCMC	Yes	No	Level 3 is measured against R1.2 but that requirement states “acceptable methods . . . but not limited to . . .”. This would imply that any method is okay so how do you measure compliance? This needs to be rewritten to state if each of these methods must be all included or if anyone can be included. M2 is difficult to measure. 30 days need to go to requirements. Measure works if requirement stated what constitutes “available”, such as posting information on a website or change the measure to state how the entity should document that information was provided on request or available.
Response: The drafting team agrees and changed the language to, " Such methods can include " instead of "including… but not limited to". Defining what constitutes availability of the procedure is too prescriptive of the RRO and the auditor. There are alternative methods for making a procedure available to those who need it and the compliance monitor should be able to determine if it is available.			
Joseph D Willson – PJM	Yes	No	Level 3 is measured against R1.2 but that requirement states “acceptable methods.. but not limited to ..” This would imply that any method is ok so how do you measure compliance? (you can’t) M2 is difficult to measure.
Response: The drafting team agrees and changed the language to, " Such methods can include " instead of "including… but not limited to". Defining what constitutes availability of the procedure is too prescriptive of the RRO and the auditor. There are alternative methods for making a			

Commenters	Reliability Need?	Acceptable Translation?	Comments
procedure available to those who need it and the compliance monitor should be able to determine if it is available.			
PPL Corporation	Yes	Yes	PPL supports this proposed standard, which improves analytical models used in planning and operating reliability studies. PPL agrees that there are a number of valid sources of information in addition to testing, which include manufacturer data, operational data, performance tracking, simulation and analysis. PPL agrees that Regional Reliability Organizations must allow for exemptions for certain classes of generation units, as appropriate. It is felt that all units under 70 MWs should be exempt from most of these standards due to minimal effects on the system.
Response: Thank you for your comments. The exemption criteria are to be defined by the RRO procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
Samuel W. Leach – TXU Power	Yes	Yes	The development of this translation will need to be flexible enough to address problems associated with verification of required parameters on onlder generation equipment. In some cases, the best avbailable information may be the original manufacture's design data.
Response: The drafting team agrees and believes these considerations can be included in the regional procedure. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data. The commenter is encouraged to offer assistance in developing the regional procedures.			
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	Using the term verify is vague and subject to different interpretations by various entities. Although there is opposition to field testing generating units, it needs to be acknowledged that field testing is the best way to obtain accurate technical data, resulting in more accurate models and parameters. However, because of the large volume of tests to perform, and the high cost to perform them, field testing should be phased-in over a 5 to 8 year time period. It is not possible to test all required units within a one year time frame.
Response: Testing is one alternative. The RRO's procedures will identify acceptable verification methods. The standard states that testing is one acceptable method, but not the only acceptable method. The implementation plan for this set of standards (MOD-023 through MOD-027) is staged so that generator owners will not be required to verify all data for all units in the first year. Generator Owners have more than 5 years to become fully compliant with some of the requirements.			
Dan Griffiths – PA Office of	Yes	Yes	As a general rule applying to MOD-23 through 27, verification of equipment and performance data should be clearly required so that effective assessment and planning is

Commenters	Reliability Need?	Acceptable Translation?	Comments
Consumer Advocate			always feasible. Past experience seems to show that data/model reporting may fall victim to cost cutting by generation owners unless reporting requirements are specific and strong.
Response: Thank you for your support of the standards.			
Karl A. Bryan - US Army Corps of Engineers	Yes	Yes	The generator data should be sent to the Transmission Service Provider so that they can check the data for usability in the system models. Once the data has been checked by the TSP, the TSP should be the one providing the data to the RRO.
Response: The drafting team disagrees and believes sending the data to the TSP would not be consistent with the functional model.			
TVA	Yes	Yes	There needs to be a reference for the regions to have a common interval for verification and re-verification.
Response: The drafting team believes that the interval for verification and re-verification should be left up to the RRO so that regional reliability needs can be considered.			
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	This proposed standared does not combine the requiremtnes of the voltage regulator data and the excitiation system modeling as proposed In standard MOD-26-1.
Response: Please see the Summary Consideration – the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-026 contains the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. . The requirements for voltage regulators and excitation systems are combined in MOD-026 R 1.4.1 through R1.4.8			
SERC EC Generation Subcommittee (GS) Jerry Nicely – TVA Nuclear Generation	Yes Yes	Yes Yes	The RRO procedures should include definitions for gross and net real and reactive power capability (e.g. MNDC, continuous, maximum) and location of measurement.
Response: The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	R1.4 requires verification parameters including generator gross and net real power and generator gross and net reactive power. Clarification can be added by including a definition requirment of gross real power, net real power, gross reactive power and net reactive power as applied by the generator owner. Or, NERC could develop minimum definitions that would apply to all generating facilities.
Response: The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	R1.4 requires verification parameters including generator gross and net real power and generator gross and net reactive power. We recommend clarification be added defining gross real power, net real power, gross reactive power and net reactive power.
Response: The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			
John Horakh – MACC	Yes	Yes	Good translation. However, the proposed effective date of November 1, 2005 is unrealistic. The RRO may not have all the required procedures established, or written and formally approved, or made available. An effective date of one year beyond Board approval is more realistic.
Response: The proposed effective date for the RRO to develop these procedures has been changed to January 1, 2007, which is almost a year beyond BOT adoption.			
Xcel Energy – Northern States Power	Yes	Yes	A time period should be developed where the Regional Reliability Organization can establish procedures necessary to meet this standard. Implementation of all other related standards should be delayed until this task is complete.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The proposed effective date for the RRO to develop these procedures has been changed to January 1, 2007, which is almost a year beyond BOT adoption.			
Southern Company Generation	Yes	Yes	The regional procedures should be developed with input from Generator Owners and Operators to ensure the methodologies are safe, practical, and reasonable.
Response: The drafting team agrees. The commenter is encouraged to offer assistance in developing the regional procedures.			
Southern Company – Transmission	Yes	Yes	The regional procedures should be developed with input from Generator Owners and Operators to ensure the methodologies are safe, practical, and reasonable. Add R1.6: – Any field changes made by the Generation Owner or Generator Operator to the verified data described in R1.4 above shall be re-verified / tested as soon as possible. Such changes, and their associated verification/testing results, shall be reported to the region, and coordinated with the Transmission Owner, Planning Authority, and Transmission Planners within 30 days.
Response: The drafting team agrees generator participation is needed. The commenter is encouraged to offer assistance in developing the regional procedures. Requirements to report changes to previously verified data are to be addressed within the RRO procedure.			
D. Byran Guy – Progress Energy, Inc.	Yes	Yes	PEC supports the language used that allows for alternate methods of verifing data for modeling other than testing. In R1.4.1. & R1.4.2 add that data provided should include an explaination of values including metered location to insure data is consistently applied to models R1.4.3. & R1.4.4. RRO procedures should address methods to translate data into modeling parameters.
Response: The drafting team agrees with the first comment. The second and third comments should be addressed as details of the RRO procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
Mohan Kondragunta – Southern	Yes	Yes	SCE suggests changing the word procedures in R1 to methods or guidelines. The term procedure can be interpreted as a prescriptive, step by step, document.

Commenters	Reliability Need?	Acceptable Translation?	Comments
California Edison WECC Reliability Subcommittee	Yes	Yes	
Response: The procedure would state which 'methods' of data validation are acceptable within the region. The term 'guideline' is inappropriate because the verification is not meant to be optional.			
Transmission Subcommittee			MOD-023-1, R1.2.: TS recommends putting more emphasis on performance tracking and testing. Relying on manufacturer data, simulation, and analysis, may not generate enough data. MOD-023-1, R1.4.1., and R1.4.2.: TS recommends linking these two requirements. Currently there is no linkage between voltage and reactive power testing. MOD-023-1, R2, and M2,: TS recommends including Transmission Operator within R2 and M2.
Response: The drafting team believes that testing and performance tracking are not the only appropriate methods for data validation. Other verification methods may be more appropriate when considering reliability needs, risk factors, cost factors, etc. Voltage and reactive power testing are linked in MOD-025. Real power capability verification is addressed separately in MOD-024. The drafting team agrees with adding the transmission operator as a recipient of the RRO procedure and has made the change in the set of revised standards (MOD-024 through MOD-027).			
FRCC	Yes	Yes	R3 should not be a requirement. It is a measure that is already covered in M3.
Response: The drafting team agrees and has removed the redundant requirement and measure.			
Midwest Reliability Organization	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Resource Issues	Yes	Yes	

MOD-023-1 Procedures for Verifying Generation Equipment Data

Commenters	Reliability Need?	Acceptable Translation?	Comments
Subcommittee			
Entergy	Yes	Yes	
Doug Hohbough – First Energy Corp.	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team split MOD-023 and distributed the requirements for the RRO to develop procedures into the associated MOD-024 through MOD-027 standards. The drafting team recommends the RRO have two months to develop procedures relative to real power capabilities (MOD-024) and almost a year for reactive power capabilities (MOD-025). The drafting team recommends waiting until after field testing MOD-026 and MOD-027 before determining associated effective dates.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		The Regional Reliability Organization needs time to develop accepted standards and methods for determining consistent requirements for the associated standards for Generator Owners in MOD-025-1, MOD-026-1, and MOD-027-1.
Response: Agree. Please see the summary consideration.			
John K. Loftis, Jr. – Dominion – Electric Transmission Entergy SERC EC Planning Standards Subcommittee (PSS)	Yes Yes Yes		The effective date of the old II.B related standards should be moved to a later date. Because the requirements are contingent upon the development of RRO procedures, NERC should allow the RRO sufficient time to develop or revise their regional procedures to reflect the revised Reliability Standards. Field testing will be required to verify that the new RRO procedures are appropriate. The effective date of these standards should be determined after field testing.
Response: Agree. Please see the summary consideration.			
Karl Kohlrus - City Water, Light & Power	Yes	11/01/06	Testing of voltage regulator controls, speed/load governor controls and excitation systems is new and should be field tested.
Response: Agree. The drafting team is recommending that MOD-026 and MOD-027 both be field tested before being finalized.			
Xcel Energy – Northern States Power	Yes	1/2007	Time needed for RRO to establish criteria as described in Standard. Also need one year cycle for membership to align its processes to support compliance.
Response: Agree. Please see the summary consideration. For MOD-024 the drafting team is recommending that Generator Owners have a year to meet compliance, and two years for MOD-025.			
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	11/01/10	For as long as the topics of generator model testing and governor model testing has been around I have yet to see demonstrated an effective, reasonably safe and reasonably priced test not requiring highly specialized talent and instrumentation. As

			long as 'testing' is used in the standard an effective date cannot be set until each specific tests is detailed, demonstrated and agreed upon.
Response: Agree. Please see the summary consideration.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

MOD-024-1 Verification of Generator Gross and Net Real Power Capability

Gred Mason – Dynergy Generation	(From Q 4 – Other comments) MOD-024-1 and MOD-025-1 seem redundant to R13 of TOP-002-0.Suggest deleting R13 of TOP-002-0.

Response: R13 of TOP-002 addresses the need to verify the capability of a generator in the operational horizon, considering such factors as ambient and water temperatures, fuel availability and quality, etc. MOD-024 and MOD-025 address verification of longer-term capabilities used for modeling purposes.

IESO	(From Q 4 – Other comments) R2.1, M2, Levels of non-compliance 2.3 and 2.4.2 We suggest replacing 'real' power with 'active' power.

Response: Real Power is already a defined term in the NERC glossary of terms for reliability standards and is the same term used in the original planning measure.

PPL Corporation	(From Q 4 – Other comments) The Regional Reliability Organization needs to determine the frequency and overall criteria required for any generation testing in support of these new standards. The needs basis shall only evaluate units that have a significant affect on the safe and reliable operation of the transmission system. Any test that is required on generator equipment needs to be subject to a risk analysis where the value of the test is evaluated against the risk that such test would impact the generation equipment and transmission system. Only units or stations that have a significant affect on the system should be tested. Nuclear units should be exempted from on-line testing unless the Nuclear Generator Owner can demonstrate through the 10CFR50.59 screening process that such testing is not an Unreviewed Safety Question (USQ). PPL believes that real-time operational data could be used in lieu of on-line testing in some instances to validate the range of reactive capabilities.

Response: The drafting team agrees. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs.

The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a

Commenters	Reliability Need?	Acceptable Translation?	Comments
			portion or all of the procedures for verifying generation equipment data. The commenter is encouraged to offer assistance in developing the regional procedures.
SPP Transmission Working Group			(From Q 4 – Other comments) MOD-023 thru 027 should include planning authorities.
			Response: The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures as well as the data from the Generator Owner.
Pacific Gas and Electric			It is not clear what is required to verify "sustainable gross and net real power capability" as established by Regional Reliability Organization procedures. If testing is required, same comment as MOD 023 1
			Response: The RRO verification procedure will define what is required to verify the gross and net real power. The drafting team has removed the term 'sustainable' to be consistent with changes made to the RRO's requirements and in recognition that the region may require factors other than sustainable (e.g. maximum short-term capability).
Barry Green – Ontario Power Generation			There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, MOD-024-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case, the appropriate entity to meet the requirements.
			Response: The functional model assigns capability verification to the generator owner. The comment could be an issue when there are joint owners, but in these cases there are agreements to address delegation of this task among the owners.
Joseph D Willson – PJM	Yes	No	Consider re-writing MOD-024-1 and MOD-025-1 as a single standard.
			Response: The drafting team believes it is more practical to implement these as separate standards.

Commenters	Reliability Need?	Acceptable Translation?	Comments
FRCC	Yes	No	The language in MOD-024-1 and MOD-025-1 are duplicative, and should be combined into one standard. Generator Owners cannot respond to MOD-024 and -025 independently. The standard should consider requiring the GO to verify the "D" Curve capability.
Response: The drafting team believes the standards for real and reactive power capability verification are related, but not duplicative. The drafting team believes it is more practical to implement these as separate standards. The 'D' curve may indicate a relationship between real and reactive power capability, the method and form of reporting generator capability is to be determined by the RRO procedure.			
Resource Issues Subcommittee	Yes	No	The language in MOD-024-1 and MOD-025-1 seems to be duplicative and consideration should be given to combining MOD-024 and MOD-025 into one standard. Generator Owners cannot respond to -024 and -025 independently. The standard should consider requiring the GO to verify the “D” curve capability.
Response: The drafting team believes the standards for real and reactive power capability verification are related, but not duplicative. The drafting team believes it is more practical to implement these as separate standards. The 'D' curve may indicate a relationship between real and reactive power capability, the method and form of reporting generator capability is to be determined by the RRO procedure.			
Kansas City Power and Light	Yes	No	It appears that these requirements are addressed in standards MOD-010 through MOD-013. R2 and M2 should include the Planning Authority
Response: MOD-010 to 013 address reporting of data and what types of data need to be reported. MOD-024 focuses more specifically on verification of real power capability of generator equipment. The drafting team agrees and added planning authority as a recipient of the RRO’s procedures and of the generator data.			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	R2 should include the Planning Authority. Refer to Functional Model, Planning Authority, 1C.
Response: The drafting team agrees and added planning authority as a recipient of the RRO’s procedures and of the generator data.			
Wing Joe- BC Hydro	No Answer	No	The purpose of this standard is misleading. One can not expect the equipment to be consistent with the model. It is the model that needs to be consistent with and to mimic the equipment. The purpose of this standard should be for the generator owners to provide accurate generators data. The standard need to recognize that the Gross and net real

Commenters	Reliability Need?	Acceptable Translation?	Comments
			power for hydro electric unit are nearly identical and the auxiliary load are insignificant.
			Response: The drafting team agrees and has modified the purpose.
			The gross and net real power capability of a hydro unit should simply be accurately reported – there is no problem if they are nearly identical. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data.
Constellation Generation Group	Yes	No	Auxillary and net outputs cannot be measured at many combustion turbine sites. Auxillary loads at steam plants cannot always be tied to a specific unit. Example: coal conveying equipment is powered by Unit 1 but coal but same coal is burned in Units 2 & 3.
			Response: The drafting team does not disagree with these comments. The drafting team added a requirement for the RRO's procedures to identify criteria for reporting generating unit auxiliary loads.
Mark Kuras – MAAC	Yes	No	The term …verify… is too vague; therefore I propose to change …verify… or …verification… to …test or otherwise demonstrate… throughout the standard. Delete text under Additional Compliance Information because it is up to the region as to how compliance will be measured. This text adds nothing to the standard.
			Response: The term 'verify' is used because there are numerous methods to ensure the data is accurate. The RRO will determine the verification methods. The standard states that testing is one acceptable method, but not the only acceptable method.
			The compliance information identifies how compliance with NERC standards will be determined. If the compliance information indicates that compliance will be measured through annual self-certification, then that is how the Compliance Monitor must measure compliance with this standard. It is not completely up to the Region to determine how to measure compliance with NERC Standards.
Data Coordination Working Group	Yes	No	Title should say VERIFICATION OF SUSTAINABLE GENERATOR GROSS AND NET REAL POWER CAPACITY. Net Real Power should be defined. RRO should require physical testing. R2 & M2 should include the Planning Authority. Refer to Funtional Model, Planing Authority, 1c.
			Response: The title was revised and 'sustainable' was removed because there may be other relevant characteristics.
			The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should

Commenters	Reliability Need?	Acceptable Translation?	Comments
			be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature. The RRO will determine the verification methods so they can reflect regional needs. The standard states that testing is one acceptable method, but not the only acceptable method. The drafting team added the Planning Authority to the list of entities that will receive a copy of the RRO's procedures as well as the data from the Generator Owner.
Gred Mason – Dynergy Generation	Yes	No	1.NERC should not eliminate specifying a minimum verification frequency(annual in the current standard).NERC should provide this guidance to the Regions.Regions can always be more stringent when regional needs require more frequent verification.Therefore,suggest adding "annual" verification requirement in Sections B,R1 and C,M1. 2.Section C,M2 is missing "…of request by the Regional Reliability Organization." at the end of the section. Response: The drafting team disagrees and believes there is consensus among commenters to leave the periodicity of the data verification to be defined in the RRO procedure. Re: M2 - The standard was revised to require the RRO to specify a schedule and periodicity for verifying and reporting this data – the GO must now provide the data according to that schedule.
Southern Company Generation Southern Company – Transmission	Yes Yes	No No	1. R2.1 should not refer to summer and winter capabilities. The RRO should define the seasons needed for MW verification. Therefore, R2.1 should be changed to: R2.1. Gross and net real power capabilities of each unit based on the power factor level expected for each unit for the seasons required by the RRO. 2. Under R2.3, we see no reason why date and conditions should be required. 3. SoCo Generation recommends field testing MOD-024. 4. The Levels of non-Compliance as written are on a per generator basis, and will not work well for entities that have a large number of generators. The details of the requirements are left up to the RRO, and the levels of non-compliance should be rewritten as follows: 2.1. Level 1: Verified generator data were provided and were complete for less than 90% of a generator owner's units as required by the RRO procedures.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			2.2. Level 2: Verified generator data were provided and were complete for less than 85% of a generator owner's units as required by the RRO procedures. 2.3. Level 3: Verified generator data were provided and were complete for less than 80% of a generator owner's units as required by the RRO procedures. 2.4. Level 4: Verified generator data were provided and were complete for less than 75% of a generator owner's units as required by the RRO procedures. Response: 1. Changed 'summer and winter' to 'seasonal' to allow RRO procedure to define seasonal reporting requirements. 2. Conditions are needed to understand that modeling assumptions are valid; date is important to understanding the age of the verification information. The standard does not specify which conditions must be documented – that would be specified in the RRO procedure. 3. Most commenters indicated that this standard does not require field testing. 4. The objective is to have verified capability data from each generator that isn't exempt from the RRO's procedures, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation.
SPP Generation Working Group	Yes	No	R2.1 We don't understand why gross is needed. For grid operations, NERC should be concerned about capability to place real energy on the grid and not what's produced internally. We believe gross data to NERC is superfluous and emphasis should be on high quality required data and not high volumes of data. We have billable quality meters at interconnect for net, but not inside plant for gross. Providing gross real energy would require additional expense to get billable quality meter in the plant and we don't see any benefits. If the standard said either gross or net, that would be acceptable to us. R2.2 We don't understand why auxiliary loads are needed if net real power capabilities are provided Compliance: If the "one calendar year" will allow "Operation Test" as currently done in SPP and actual test once every three years, then "one calendar year" is acceptable If the "one calendar year" means we must perform an actual test every year this is not acceptable. Performance of the actual test is much more time consuming and difficult to complete.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			Response: Dynamic modeling and stability analysis require inputs of generator gross real power output and auxiliary loads. The one calendar year compliance review cycle does not require or imply that verification is required each year. The periodicity of verification is set by the RRO procedure and may be longer than one year. The 'compliance monitoring and performance reset' period is the period in which compliance with the requirements is measured and then 'reset' to the starting point of no violations.
Peter Burke – American Transmission Co.	Yes	No	R2.3 Recommend that acceptable methods of verification in RRO procedures are limited to Testing or Performance Tracking only (see comment for MOD-023). Title of standard should be changed to replace the word "dependable" with "sustainable" to be consistent with R1.
			Response: There are other verification methods than testing and performance tracking. Appropriate methods should be determined in the RRO procedure. Sustainable was removed, as there may be other relevant characteristics defined in the RRO procedure.
Joseph F. Buch – Madison Gas and Electric	Yes and No	No	The standard has no criteria for how often the testing must be done. It also does not recognize the differences between base load units and units which are seldom run. There are significant costs to test & we question the reliability benefits of testing all the units annually, especially those units which seldom run. In addition the standard indicates that the testing is to be done at the power factor levels expected. Nothing in the standard indicates who or how the "power factor levels expected" is to be determined. As a generator owner we cannot recommend approval of a standard for which we do not know what testing we are going to have to perform.
			Response: Frequency of verifications is to be addressed in the associated RRO procedure. The commenter is encouraged to offer assistance in developing the regional procedures. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The RRO's procedure will address applicable conditions for verification – note that the reference to power factor was removed from the revised standard.
Multi-Regional Modeling Working Group	Yes	No	The term …verify… is too vague; therefore we propose to change …verify… or …verification… to …test or otherwise demonstrate… throughout the standard. Delete text under Additional Compliance Information because it is up to the region as to how compliance will be measured. This text adds nothing to the standard.
			Response: Testing is one alternative. The RRO's procedure will identify the acceptable verification methods. The standard states that testing is

Commenters	Reliability Need?	Acceptable Translation?	Comments
one acceptable method, but not the only acceptable method. The compliance information identifies how compliance with NERC standards will be determined. If the compliance information indicates that compliance will be measured through annual self-certification, then that is how the Compliance Monitor must measure compliance with this standard. It is not completely up to the Region to determine how to measure compliance with NERC Standards.			
John Horakh – MACC	Yes	Yes	Good conversion from prescribed testing to verification. However the Generator Owner may require significant time beyond November 1, 2005 for the initial verification, depending on the RRO requirements. An effective date of one year beyond Board approval is more realistic.
Response: The drafting team is proposing a phased implementation to allow responsible entities to achieve compliance.			
D. Byran Guy – Progress Energy, Inc.	Yes	Yes	PEC supports the language used that allows for alternate methods of verifing data for modeling other than testing.
Response: Thank you for your comment.			
WECC Reliability Subcommittee	Yes	Yes	WECC RS agrees with the removal of the annual testing requirement and that it should be established by the RRO.
Mohan Kondragunta – Southern California Edison	Yes	Yes	
Response: Thank you for your comment.			
Data Coordination Working Group	Yes	Yes	The Energy Information Administration (EIA) collects these data in their annual EIA-860 generator survey. EIA specifies reporting procedures and definitions. DCWG's concern is that the EIA procedures and definitions may not be consistent compared with individual NERC Region procedures and definitions. Please see DCWG comments relating to the deletion of II.D.M3 for further detail on government/NERC coordination.
Response: The drafting team does not disagree with the need for consistent reporting of data. However, reporting of after-the-fact data to a government agency is not a reliability issue for consideration in a standard.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	Generators should not be required to test their machines over the limits specified in planning models. For example, if the transmission owner/operator specifies minimum reactive capability of 0 MVAR is all that is required, the generator should not be required to test at leading power factors. Operation of units in the underexcited leading power factor mode can lead to instability and voltage problems. These leading power factor tests should only be required if there is a system need to operate at these levels.
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	Using the term verify is vague and subject to different interpretations by various entities. Although there is opposition to field testing generating units, it needs to be acknowledged that field testing is the best way to obtain accurate unit capability. For units that run at full power most of the times (e.g. - base load units), MW capability should be accepted at that level unless the owner wants to claim higher MW capability. Because of the large volume of tests to perform, and the high cost to perform them, field testing should be phased-in over a 3 to 5 year time period. It is not possible to test all required units within a one year time frame. The Levels of Non-Compliance as written are on a per generator basis, and will not work well for entities that have a large number of generators. In addition, because the details of the requirements are left up to the RRO, the levels of non-compliance should be rewritten as proposed in the comments provided by the SERC Planning Standards Subcommittee (PSS).

Response: Verification conditions are to be addressed in the RRO's procedures for generator data verification. The commenter is encouraged to offer assistance in developing the regional procedures. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The RRO procedure should address applicable conditions for verification. Note that the reference to power factor was removed from the revised standard.

Response: Testing is one alternative. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The standard states that testing is one acceptable method, but not the only acceptable method.

The standard was revised to require the RRO to identify a schedule and periodicity for performing the verification and reporting the data. The proposed effective dates give the RRO two months to develop and distribute their requirements and GOs an additional three months to begin meeting compliance. Again, testing is one acceptable method, but not the only acceptable method of verifying this data.

MOD-024-1 Verification of Generator Gross and Net Real Power Capability

Commenters	Reliability Need?	Acceptable Translation?	Comments
The objective is to have verified capability data from each generator that isn't exempt from the RRO's procedures, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation.			
Raj Rana – AEP	Yes	Yes	Reword the title as follows: Verification of Generator Real Power Gross and Net Dependable Capability. --- Reword 1.4 Additional Compliance Information as follows: The Generator Owner shall demonstrate compliance through transmitting the verified data to Transmission Owner/Operator/Planner, and through self-certification or audit - as determined by the Compliance Monitor.
Response: The drafting team has removed the term 'sustainable' from the title to be consistent with MOD-023. The drafting team also believes 'dependable' is not appropriate, in recognition that the region may require factors other than sustainable or dependable (e.g. maximum short-term capability). Real power was added to the title. The proposed addition to compliance information is a requirement, not an explanation of compliance process.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation	Yes	Yes	R1 as stated above (MOD-023) we recommend clarification be added describing defining gross real power, net real power, gross reactive power and net reactive power.
Brenda Anderson Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Response: The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.			
Transmission			MOD-024-1, Requirements, Recommend establishing linkages between sandards. In this

Commenters	Reliability Need?	Acceptable Translation?	Comments
Subcommittee			particular standard, there appears to be a link between MOD-023-1 and MOD -024-1. Response: the drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 through MOD-027 each contain the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. This change should make implementation easier.
Doug Hohbough – First Energy Corp.	Yes	Yes	R2.2: Real power requirements of aggregate auxialry loads at unit's net real power capability. It appears that the documentation that the Generation Owner maintains would not be complete unless the Owner documents pertinent unit conditions present at the time of the test (cold H2, generator winding temperatures, etc). How/where will these items be addressed? Response: The drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 contains the RRO's requirement to develop a procedure for data verification (including a requirement for the Generator Owner to report the conditions under which verification is completed), along with the Generator Owner's requirement to verify and report that data.
Gerald Rheault – Manitoba Hydro	Yes	Yes	R2.3: Physical testing of the generator should be required. Also, what is the frequency of testing required? The wording in M2 should be modified to add "of request" after "30 calendar days". Response: Testing is one alternative. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The standard states that testing is one acceptable method, but not the only acceptable method. Frequency of verifications is to be addressed in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. Re: M2 - The standard was revised to require the RRO to specify a schedule and periodicity for verifying and reporting this data – the GO must now provide the data according to that schedule.
IESO – Ontario	Yes	Yes	R2.3 - Seasonality needs to be considered also - i.e. summer vs winter etc. Response: Season was added to replace summer and winter.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Midwest Reliability Organization	Yes	Yes	M2. change "within 30 calendar days." to "within 30 calendar days of request". D2. Levels of non-compliance. Where "some" is used for non-compliance, is it possible to define further?
			Response: Re: M2 - The standard was revised to require the RRO to specify a schedule and periodicity for verifying and reporting this data – the GO must now provide the data according to that schedule. The levels of non-compliance were revised to avoid the use of the term, 'some'.
PPL Corporation	Yes	Yes	PPL supports the objective of this proposed standard. However, there should be exemptions for "energy-only" units, i.e., units that are not designated as capacity resources. Also, testing of hydro units should be waived if the units' outputs are restricted by conditions that are beyond the plant operator's control, such as reduced river flows for run-of-river units, or reservoir capacity limitations, restrictions imposed by fishery protection regulations, etc. In addition, there is minimal difference between gross and net real power for hydro units so if a test is required, testing for either gross or net should be acceptable. Also, testing small units as an aggregate should be acceptable.
			Response: Exemptions and verification conditions are to be defined in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. The standard is not concerned with whether gross and net real power capability are close to each other, just that they need to be accurately reported. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data.
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	The levels of Non-Compliance as written are on a per generator basis, and will not work well for entities that have a large number of generators. In addition, because the details of the requirements are left up to the RRO, the levels of non-compliance should be written as follows:
Entergy	Yes	Yes	2.1 Level 1: Verified generator data were provided and were complete for less than 100% of a generator owner's units as required by the RRO procedures. 2.2 Level 2: Verified generator data were provided and were complete for less than 95% of a generators owner's units as required by the RRO procedures. 2.3 Level 3: Verified generator data were provided and were complete for less than 90% of a generator owner's units as required by the RRO procedures.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			2.4 Level 4: Verified generator data were provided and were complete for less than 85% of a generator owner's units as required by the RRO procedures.

Response: The objective is to have verified capability data from each generator that isn't exempt from the RRO's procedures, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation.

IDWG			Title needs to be changed to include the term Real Power: Verification/Testing of Generator Gross and Net Dependable Capacity — use Capacity instead of capability… Define Net Dependable Capacity in the Standard…consistent with data reporting definitions for capacity plans, as reported to the Regions and EIA. — Modify the purpose to be in keeping with what the standard does: To ensure verified generator gross and net real power capacity data are available to be used in models to assess Bulk Electric System reliability. (This standard is not going to ensure availability of Real Power – capability yes, but not availability.) Net Real Power needs to be defined…gross minus aux power fed from generator bus or minus aux from both generator bus and system (startup) bus. Also needs to consider which side of the GSU. — In R2.3 – Including Date & Condition as established in the RRO procedures – Is this for testing only? Does this imply that Date & Condition documentation has to be in the RRO procedure? MOD-023-1 does not have that as a requirement for the RRO procedure. Region writes the procedure for validating Net Dependable Capacity. If verification is test-based, date and condition is valid, but if historical data based, it is not.

Response:

The drafting team believes capability is more appropriate – the capability would describe what the generator can actually perform under the stated conditions. This may be different than the capacity of the generator.

The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.

The drafting team has revised the purpose statement as requested.

The drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-024 contains the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. This change eliminates the interdependencies between this set of standards and should make implementation easier. The RRO's procedure needs to define any applicable required conditions for verification. The generator report needs to identify actual date and conditions during verification.

MOD-024-1 Verification of Generator Gross and Net Real Power Capability

Commenters	Reliability Need?	Acceptable Translation?	Comments
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	Yes	
Individual Members of CCMC	Yes		
Cinod Kotecha	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
NERC Interconnection Dynamics Working Group	Yes	Yes	
NPCC CP9 RSWG	Yes	Yes	
Samuel W. Leach – TXU Power	Yes	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
Ed Riley – California ISO	Yes	Yes	
ISO/RTO Council Standards	Yes	Yes	
Alan Adamson –	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
NYSRC			
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Kathleen Goodman – ISO-NE	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	Yes	
SERC EC Generation Subcommittee (GS)	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
Consolidated Edison	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: Most commenters did not indicate a need to field test this standard. The drafting team is recommending that the RRO have 2 months to develop the procedures for verifying generator gross and net real capability and recommends that Generator Operators have an additional three months to comply with the RRO's procedures.

Commenters	Field Test Required?	Recommended Date?	Justification
Southern Company Generation Southern Company – Transmission	Yes Yes		Recommend field testing for the purpose of coordinating this effort between Transmission Operators, Generator Operators, and Transmission Planners and development of appropriate procedures. Various methods will be employed among different utilities and generators to do this verification. Some refinement in the processes and procedures are expected as experience is gained and should enhance the safety and reliability of the overall verification process. This supports the allowance of a reasonable period of time to achieve compliance.

Commenters	Reliability Need?	Acceptable Translation?	Comments

MOD-025-1 Verification of Generator Gross and Net Reactive Power Capability

Gred Mason – Dynergy Generation	(From Q 4 – Other comments) MOD-024-1 and MOD-025-1 seem redundant to R13 of TOP-002-0.Suggest deleting R13 of TOP-002-0.

Response: TOP-002, R13 addresses reporting of generator capability in the operating horizon and does not address the provision of accurate data for reliability models.

PPL Corporation	(From Q 4 – Other comments) The Regional Reliability Organization needs to determine the frequency and overall criteria required for any generation testing in support of these new standards. The needs basis shall only evaluate units that have a significant affect on the safe and reliable operation of the transmission system. Any test that is required on generator equipment needs to be subject to a risk analysis where the value of the test is evaluated against the risk that such test would impact the generation equipment and transmission system. Only units or stations that have a significant affect on the system should be tested. Nuclear units should be exempted from on-line testing unless the Nuclear Generator Owner can demonstrate through the 10CFR50.59 screening process that such testing is not an Unreviewed Safety Question (USQ). PPL believes that real-time operational data could be used in lieu of on-line testing in some instances to validate the range of reactive capabilities.

Response: The drafting team agrees. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs.

The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data.

The commenter is encouraged to offer assistance in developing the regional procedures.

SPP Transmission Working Group	(From Q 4 – Other comments) MOD-023 thru 027 should include planning authorities.

Response: The Planning Authority was added as both a recipient of the RRO's procedures and as a recipient of the Generator Owner's data.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Pacific Gas and Electric			It is not clear what is required to verify "sustainable gross and net real power capability" as established by Regional Reliability Organization procedures. If testing is required, same comment as MOD 023 1
Response: Sustainable has been removed. Testing requirements and conditions will be determined by the regional procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
Wing Joe- BC Hydro	Yes and No	No	Model should align with the equipment, not the reverse. A definition is required net and gross reactive power capability. {I have never encountered such terminologies.} Recognize that reactive requirements for auxiliary load for hydroelectric plants are insignificant and any such requirements part and parcel of the load on the transmission system.
Response: Purpose statement has been revised as requested. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature. MOD-025-1 R1.1 requires the RRO to identify generating unit exemption criteria including documentation of those units that are exempt from a portion or all of these procedures. The drafting team encourages the commenter to participate in the regional process to develop that procedure and help identify the RRO's exemption criteria.			
Kathleen Goodman – ISO-NE	Yes and No	No	We suggest that development of this standard be deferred. The development of this standard needs more technical discussion. However, due to the importance of this requirement, until a well-vetted standard can be developed and given the local nature of reactive capability, only local and Regional Criteria should apply.
Response: Industry response indicates there is a reliability need for this standard. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The commenter is encouraged to offer assistance in developing the regional procedures.			
Constellation Generation Group	Yes	No	Full reactive testing annually is totally impractical. Requirements for reactive capabilities need to be specify operating conditions such as

Commenters	Reliability Need?	Acceptable Translation?	Comments
			system voltage, real power, house load, hydrogen pressure, etc. Reactive capability varies by transmission system conditions which are outside the control of generator.
			Response: Validation methods and conditions, as well as frequency of verifications, are to be addressed in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.
FRCC	Yes	No	The language in MOD-024-1 and MOD-025-1 are duplicative, and should be combined into one standard. Generator Owners cannot respond to MOD-024 and -025 independently. The standard should consider requiring the GO to verify the "D" Curve capability.
			Response: The drafting team believes these verifications may be done using different methods over different times and different periodicity.
Resource Issues Subcommittee	Yes	No	The language in MOD-024-1 and MOD-025-1 seems to be duplicative, and consideration should be given to combining MOD-024 and MOD-025 into one standard. Generator Owners cannot respond to -024 and -025 independently. The standard should consider requiring the GO to verify the "D" Curve capability.
			Response: The drafting team believes these verifications may be done using different methods over different times and different periodicity.
Joseph F. Buch – Madison Gas and Electric	Yes	No	See comments on MOD-024-1 regarding testing frequency and methodology. Also the standard indicates that the maximum sustainable reactive power capability both lagging and leading be determined. Operating units with reduced excitation to determine maximum leading vars creates a risk of potential damage to the unit by having the unit pull out of step. It is recommended that this standard undergo field testing to better define the requirements. At the same time the cost versus reliability benefits for testing small units (<50 MW) should be evaluated.
			Response: See response to comment on MOD-024. The drafting team agrees. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data. The commenter is encouraged to offer assistance in developing the regional procedures.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Tennessee Valley Authority	Yes	No	The Transmission Planner is not mentioned in the Applicability Section of this standard . Delete text under Additional Compliance Information. The term verify is very vague. Throughout the standard, change …verify… or …verification... to …test or otherwise demonstrate… Add …leading and lagging… after …reactive power capability… in R1.

Response: This standard does not apply to the transmission planner. The planner only receives the information. Transmission planner requirements are addressed in standards MOD-010 and 012.

The compliance information identifies how compliance with NERC standards will be determined. If the compliance information indicates that compliance will be measured through annual self-certification, then that is how the Compliance Monitor must measure compliance with this standard. It is not completely up to the Region to determine how to measure compliance with NERC Standards.

Testing is one alternative. The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The standard states that testing is one acceptable method, but not the only acceptable method.

'Leading and lagging' are addressed in the standard. (R1.5.1 in the revised standard)

Commenters	Reliability Need?	Acceptable Translation?	Comments
Southern Company Generation	Yes	No	We recommend deleting R2.3 and remove date and conditions from R3. Also, SDT should incorporate the levels of non-compliance for this standard as recommended for MOD-024. This new standard will require extensive operation effort, engineering analysis, and field testing to accomplish. Furthermore, it is impractical for a Utility with many large generating units to accomplish full compliance in a short time period. While we agree fundamentally there is a reliability need for this standard, the reliability importance and impact of all generators on the system is not the same. A phased approach that prioritizes the implementation for existing generators would provide reliability benefits and help reduce the strain on industry resources. We recommend this approach be reflected under the Compliance section, allowing an initial seven calendar year phase-in period, then one calendar year. The accomplishment of this should be coordinated with Standards MOD-026-1 and PRC-019.

Response:

Dynamic modeling and stability analysis require inputs of generator gross reactive power output and auxiliary loads so R2.3 was not deleted.

Conditions are needed to understand that modeling assumptions are valid; date is important to understanding the age of the verification

Commenters	Reliability Need?	Acceptable Translation?	Comments

information. The standard does not specify which conditions must be documented – that would be specified in the RRO's procedure.

The objective is to have verified capability data from each generator that isn't exempt from the RRO's procedures, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation. MOD-025-1 R1.1 requires the RRO to identify generating unit exemption criteria including documentation of those units that are exempt from a portion or all of these procedures. The drafting team encourages the commenter to participate in the regional process to develop that procedure and help identify the RRO's exemption criteria.

The drafting team is proposing that the RRO have almost a year to become compliant with its requirements, with the Generator Owner becoming compliant a year after the RRO. This supports your suggestion.

Although there are correlations between MOD-26 and MOD-019 and this standard, the standards are not dependent upon one another for implementation.

Gred Mason – Dynergy Generation	Yes	No	1.NERC should not eliminate specifying a minimum verification frequency(every 5 years in the current standard).NERC should provide this guidance to the Regions.Regions can always be more stringent when regional needs require more frequent verification.Therefore,suggest adding "every five years" verification requirement in Sections B,R1 and C,M1. 2.Section C,M2 is missing "…of request by the Regional Reliability Organization." at the end of the section. 3.The proposed standard eliminated the language in Section M3 of the current standard that reads:"If safety or system conditions do not allow testing to full capability,computations and engineering reports of estimated capability shall be provided."This guidance needs to also be included in the proposed standard(suggest adding it as Section B,R2.4).

Response: Frequency of verifications is to be addressed in the RRO's procedure. The RRO procedure will address applicable conditions for verification.

The RRO was assigned responsibility for developing these procedures so that these procedures can reflect regional needs. The commenter is encouraged to offer assistance in developing the regional procedures.

Re: M2 - The standard was revised to require the RRO to specify a schedule and periodicity for verifying and reporting this data – the GO must now provide the data according to that schedule.

The RRO procedure will address applicable conditions for verification as well as any generator exemption criteria.

Southern Company – Transmission	Yes	No	Requirements R2.1, R2.2, R2.3, R2.4 belong in MOD-023. These are details that should be specified in the Regional requirements.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			We recommend deleting R2.3 and remove date and conditions from R3. R2 should say -The Generator Owner shall provide the Regional Reliability Organization and the applicable Transmission Planner(s) with the information required by the Region on request.- Since this is a new standard and will require extensive operating effort, engineering analysis, field testing and coordination to accomplish, it is recommended that NERC and the regions allow ample time for the industry to comply. A compliance phase-in period of 2-3 years is recommended.

Response: The drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-025 contains the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data.

Dynamic modeling and stability analysis require inputs of generator gross reactive power output and auxiliary loads so R2.3 was not deleted. Conditions are needed to understand that modeling assumptions are valid; date is important to understanding the age of the verification information. The standard does not specify which conditions must be documented – that would be specified in the RRO procedure.

The revised standard includes the following requirement:

The Generator Owner shall follow its Regional Reliability Organization's procedure for verifying and reporting its gross and net Reactive Power generating capability per MOD-025 R1.

The drafting team is proposing that the RRO have almost a year to become compliant with its requirements, with the Generator Owner becoming compliant a year after the RRO. This suggestion seems to be a compromise between the various suggestions provided by stakeholders.

Gerald Rheault – Manitoba Hydro	Yes	No	Requirements should include consideration of the unit transformer tap and tap range in reactive capability. Also, frequency of testing should be specified.

Response: The standard addresses methods to verify reactive capability with a unit transformer tap setting in use; not to verify capabilities under all tap settings for the purpose of optimizing tap settings. Unit transformer taps are not frequently changed.

Frequency of verifications is to be addressed in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.

Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	R2 should include the Planning Authority. Refer to Functional Model, Planning Authority, 1C.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			Response: Planning authority has been added as a recipient of the RRO's procedures and as a recipient of the Generator Owner's data.
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	I interpret requirement for an annual test. Recommend a longer time frame unless operational anomalies are encountered, possibly 5 years. Verif. Reactive Power B. R2. R2.3. Reactive Power for auxiliary loads may not be available on readable meters. Is Reactive Power for auxiliary loads really necessary if net Reactive Power is available?
			Response: There is no requirement for an annual test in this standard. The frequency of verifications is to be addressed in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. The standard does not state how the auxiliary reactive loads are determined – it may be possible to calculate the values from other verifiable data. In addition, the regional procedures are required to include generating unit exemption criteria including documentation of those units that are exempt from a portion or all of the procedures for verifying generation equipment data. The standard was revised to require that the RRO's procedures also address criteria for reporting generating unit auxiliary loads. Again, the commenter is encouraged to offer assistance in developing the regional procedures.
SPP Transmission Working Group	Yes	No	Title should say VERIFICATION OF SUSTAINABLE GENERATOR GROSS AND NET REACTIVE POWER CAPACITY. Net Reactive Power should be defined. Remove phrase INCLUDE GENERATOR TERMINALS VOLTAGE LIMITATIONS in R2.1. Move it to R2.2. R2 & M2 should include the Planning Authority. Refer to Functional Model, Planning Authority, 1c.
			Response: The title has been updated (sustainable has been removed because there may be other factors of importance than sustainability). The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature. Terminal voltage limitations has been moved to R1.5.2 – this supports your suggestion. Planning authority has been added as a recipient of the RRO's procedures and as a recipient of the Generator Owner's data.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Kansas City Power and Light	Yes	No	It appears that these requirements are addressed in standards MOD-010 through MOD-013. R2 and M2 should include the Planning Authority
Response: MOD-010 to 013 address reporting of data and what types of data need to be reported. MOD-025 focuses more specifically on verification of reactive power capability of generator equipment. Planning authority has been added as a recipient of the RRO's procedures and as a recipient of the Generator Owner's data.			
Trilok C. Garg – Mirant Mid Atlantic	Yes	No	The standard paragraph CM1, does not clearly indicate as to how a Generator Owner is supposed to verify the reactive capability of their machines. If the intention is for the Generator Owners to actually operate the generators to verify the reactive limits, that would be practically impossible. Suggest modifying the standard to clearly indicate that the Power Dispatchers shall drive the units two times in a year, winter and summer, to their reactive limits. In case the units failed to reach the rated reactive limits, the dispatcher shall record the parameters (voltage, current, temperature, etc.) restricting the reactive load, advise the plant managers of such limiting parameters, and request a disposition of the problem.
Response: The original M1 has been deleted and is replaced by what was M2 and is now M3. Any requirements and conditions for verification will be specified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
NERC Interconnection Dynamics Working Group	Yes	No	1. Title needs to be changed: Verification/Testing of Sustainable Generator Gross and Net Reactive Power Capability — 2. Modify the Purpose to: To verify sustainable generator gross and net reactive power capability data are available to be used in models to assess Bulk Electric System reliability. (This standard is not going to verify availability of Reactive Power-capability yes, but not availability.) Sustainable is added to differentiate between data used for powerflow and stability modeling purposes. — 3. Net Reactive Power needs to be defined…gross minus aux power fed from generator bus or minus aux from both generator bus and system (startup) bus. Also needs to consider which side of the GSU. — 4. R2.1 – remove phrase: including generator terminal voltage limitations…it is implied in R2.2 Reasons for reactive power limitation(s), but to be explicit, move that phrase into R2.2 —

Commenters	Reliability Need?	Acceptable Translation?	Comments
			5. In R3, including Date & Condition as established in the RRO procedures – Is this for testing only? Does this imply that Date & Condition documentation has to be in the RRO procedure? MOD-023-1 does not have that as a requirement for the RRO procedure. Region writes the procedure for validating Net Dependable Capacity. If verification is test-based, date and condition is valid, but if historical data based, it is not.
			Response: Response: 1. The drafting team believes leaving 'verification' in the title acknowledges that there are other verification methods besides testing. 2. The drafting team has revised the purpose statement to clarify that the purpose is to ensure the information is available for steady-state modeling. The term, 'sustainable' was not used because there can be a time consideration implied in the word sustainable, and how to include this time consideration is up to the Region. 3. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature. 4. Terminal voltage limitations has been moved to R1.5.2 – this supports your suggestion. 5. The drafting team subdivided MOD-023 and distributed the RRO's requirement to develop procedures directly into MOD-024 through MOD-027. Revised MOD-025 contains the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data. The RRO's procedure needs to define any applicable required conditions for verification. The generator report needs to identify actual date and conditions during verification.
Multi-Regional Modeling Working Group	Yes	No	The term …verify… is too vague; therefore we propose to change …verify… or …verification… to …test or otherwise demonstrate… throughout the standard. Add …leading and lagging… after …reactive power capability…
Mark Kuras – MAAC	Yes	No	in R1. Delete text under Additional Compliance Information because it is up to the region as to how compliance will be measured. This text adds nothing to the standard. Requirements and measures do not line up. Should be a one to one correspodence.
			Response: The drafting team believes and is supported by industry comment, that alternative methods for verification of data can also be valid. The applicable methods are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. The compliance information identifies how compliance with NERC standards will be determined. If the compliance information indicates that compliance will be measured through annual self-certification, then that is how the Compliance Monitor must measure compliance with this standard. It is not completely up to the Region to determine how to measure compliance with NERC Standards.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Peter Burke – American Transmission Co.	Yes	No	R2.1 Add 'ambient temperature' to the list of factors affecting the max. sustainable reactive power capability curve (in addition to real power output and terminal voltage). The translation mapping document includes R2.4, but the clean Draft1 standards document has the same requirement numbered R3. Recommend addressing this inconsistency by retaining the requirement as R2.4 (to be consistent with numbering used in MOD-024). R3 or R2.4: Recommend that acceptable methods of verification in RRO procedures are limited to Testing or Performance Tracking only (see comment for MOD-023).
Response: Conditions that must be considered are to be addressed in the RRO's procedure. There was a format error in the first posting. The drafting team believes and is supported by industry comment, that alternative methods for verification of data can also be valid. The applicable methods are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
SPP Generation Working Group	Yes	No	R2.1 Again, we don't understand why gross is needed. It is understood that the AEP methodology for calculating revenue requirements was at the terminal bus. However AEP is now proposing a new methodology, stating their old methodology is outdated . For grid operations, they should be concerned about capability to place reactive power on the grid, at the point of interconnect, and not what's produced at the generator's terminals. We believe it is going to be extremely difficult, if not impossible to measure a generator's full capability to produce reactive power and maintain system voltage to some degree of acceptability. The machine may well be capable of injecting and/or absorbing more VARS then the system can allow while maintaining voltage at an acceptable level. R2.3 We don't understand why auxiliary loads are needed if net reactive power capabilities are provided
Response: Dynamic modeling and stability analysis require inputs of generator gross reactive power output and auxiliary loads. Note that the revised standard requires the RRO to identify criteria for reporting generating unit auxiliary loads.			
Individual Members of CCMC	Yes	No	Level 1 references R 2.4 but there isn't an R2.4. It appears that the "clean version" file is different from the mapping file. M2 introduces "validation" instead of verification. Not sure if this is a change in the requirement.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: There was a format error in the first posting. Validation has been removed.			
Joseph D Willson – PJM	Yes	No	Level 1 references R 2.4 but there isn't a R2.4 M2 introduces "validation" instead of verification. Not sure if this is a change in the requirement. Requirement should be written to verify the generator's "D" curve and not max capability.
Response: There was a format error in the first posting. Validation has been removed. The drafting team believes these verifications may be done using different methods over different times and different periodicity.			
NPCC CP9 RSWG	Yes	Yes	NPCC Participating members suggest that development of this standard be defferred. Although NPCC believes this to be an important issue, reactive resource requirements are presently being developed at the FERC and until such Criteria has been developed and agreed upon this standard should be tabled. Until the above is accomplished the current practices the Regions are pursuing should be maintained. In addition, due to the local nature of reactive capability, only local and Regional Criteria should apply. (rearrange)
Response: Industry response indicates there is a reliability need for this standard. The detailed requirements are to be developed in a Regional procedure. The commenters are encouraged to offer assistance in developing the regional procedures.			
Cinod Kotecha	Yes	Yes	We believe this to be an important issue and reactive resource requirements are presently being developed at the FERC and until such Criteria has been developed and agreed upon this standard should continue to be developed. Until the above is accomplished the current practices the Regions are pursuing should be maintained. In addition, due to the local nature of reactive capability, only local and Regional Criteria should apply. (rearrange)
Response: Industry response indicates there is a reliability need for this standard. The detailed requirements are to be developed in a Regional procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
WECC Reliability Subcommittee Mohan Kondragunta	Yes	Yes	WECC RS agrees with the removal of the five-year testing requirement and that it should be established by the RRO.

Commenters	Reliability Need?	Acceptable Translation?	Comments
– Southern California Edison	Yes	Yes	

Response: Thank you for your comment.

D. Byran Guy – Progress Energy, Inc.	Yes	Yes	PEC supports the language used that allows fo alternate methods of verifing data for modeling other than testing.

Response: Thank you for your comment.

Barry Green – Ontario Power Generation	Yes		There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, MOD-025-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case, the appropriate entity to meet the requirements.

Response: The functional model assigns capability verification to the generator owner. The comment could be an issue when there are joint owners, but in these cases there are agreements to address delegation of this task among the owners.

PPL Corporation	Yes	Yes	PPL supports the objective of this proposed standard. However, it must be recognized that on-line testing generating units to the limits of their capability curves presents an inherent risk to the transmission system as well as the generating units themselves. Therefore, it is imperative that the Regional Reliability Organizations perform a unit-specific risk assessment before undertaking any on-line testing. Nuclear units should be exempted from on-line testing unless the Nuclear Generator Owner can demonstrate through the 10CFR50.59 screening process that such testing is not an Unreviewed Safety Question (USQ). PPL believes that real-time operational data could be used in lieu of on-line testing in some instances to validate the range of reactive capabilities.

Response: The drafting team believes and is supported by industry comment, that alternative methods for verification of data can also be valid.

Commenters	Reliability Need?	Acceptable Translation?	Comments
The applicable methods and allowable exemptions are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
John Horakh – MACC	Yes	Yes	Good conversion from prescribed testing to verification. However the Generator Owner may require significant time beyond November 1, 2005 for the initial verification. An effective date of two years beyond Board approval is more realistic.
Response: The drafting team is proposing that the RRO have almost a year to become compliant with its requirements, with the Generator Owner becoming compliant a year after the RRO. This suggestion seems to be a compromise between the various suggestions provided by stakeholders. Note that the RRO's procedure must identify a schedule and periodicity for verifications so that even after the standard becomes effective, the RRO may not require all generators to begin supplying data at the same time.			
Karl Kohlrus - City Water, Light & Power	Yes	Yes	One test per year should be all that is required with the generator owner able to provide extrapolated monthly capacities based on expected ambient conditions. The standard should specify the minimum test duration for steam units, combined cycle units, simple cycle units, and hydro units.
Response: Frequency of verifications is to be addressed in the RRO's procedure. Note that testing is not the only acceptable method of verifying generator data. The commenter is encouraged to offer assistance in developing the regional procedures. The RRO procedure will address applicable conditions for verification.			
SERC EC Planning Standards Subcommittee (PSS)			MOD-025-1, Introduction, 4. Applicability, TS recommends adding "Regional Reliability Organization." MOD-025-1, Requirements, Recommend establishing linkages between standards. In this particular standard, there appears to be a link between MOD-023-1 and MOD-025-1.
Response: RRO requirements were in MOD-023 but have been moved into MOD-025 and the RRO was added to the applicability section of the standard. Revised MOD-025 contains the RRO's requirement to develop a procedure for data verification, along with the Generator Owner's requirement to verify and report that data.			
Transmission Issues Subcommittee	Yes	Yes	R1 requires the GO to verify according to RRO requirements. The RRO requirements should require physical testing of the generator to the extent testing can be accomplished without a threat to the generator. MOD-025 should provide guidance to the RRO, and provide for NERC review of RRO procedures.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			The standard should establish a maximum five year period for verification of capabilities, unless there is a change in equipment or a setting change, at which time the generator should be retested. The NERC Board approved the TIS recommendation in its response to blackout recommendation 7a that at continuous rated power output, future generators should have an overexcited power factor capability, measured at the point of interconnection with the transmission system, of .95 or less and underexcited powerfactor of .95 or less. If a generator does not meet this requirement, the generation owner should make alternate arrangements (e.g., Statcoms, SVC, etc.) for supplying an equivalent dynamic reactive powere capability ot meet this requirement. This requirement should be incorporated into MOD-025-1 or VAR-003-1, as appropriate.
			Response: The drafting team believes and is supported by industry comment, that alternative methods for verification of data can also be valid. The applicable methods and periodicity are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. MOD-025 addresses verification of generator data and does not set operating limits. Also, the proposed criteria are beyond the scope of the SAR to translate the prior planning standards. This issue is addressed in interconnection agreements. The commenter may wish to submit a SAR to propose a new standard.
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	Section R1 - 1. The word 'verify' needs additional clairification, such as, ". . . Owner shall verify by test, operational history or other means the gross and net reactive power . . ." 2. The definition of gross and net should be given to clearly understand what is being measured versus what is used and being modeled. Does net include auxillary loads and transformer loses?
			Response: The drafting team believes and is supported by industry comment, that alternative methods for verification of data can also be valid. The applicable methods are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures. The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature.
Doug Hohbough –	Yes	Yes	R2.1 … including generator terminal and auxiliary bus voltage limitations.

Commenters	Reliability Need?	Acceptable Translation?	Comments
First Energy Corp.			
Response: There are other types of limits that may be applicable; the standard is not intended to provide an exhaustive list.			
P.D. Henderson Khaqan Khan	Yes	Yes	With regards to R 2.1, there is a need to clarify that what is meant by maximum sustainability? Is there a limit of maximum?
Response: 'Sustainable' has been removed – there are other factors that may be applicable.			
Xcel Energy – Northern States Power	Yes	Yes	R2.1 in this document - There are a number of additional variables that affect the maximum sustainable reactive power capability. Among those - Transmission System Voltage and ambient temperature. This section should include taking into account variables. R2.3 Include at what generation load point should this data be provided at. This requirement is too broad to have meaning.
Response: 'Sustainable' has been removed – there are other factors that may be applicable. The drafting team agrees there are other types of limits that may be applicable; the standard is not intended to provide an exhaustive list. Verification conditions are to be addressed in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional procedures.			
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	Using the term verify is vague and subject to different interpretations by various entities. Although there is opposition to field testing generating units, it needs to be acknowledged that field testing is the best way to obtain accurate unit capability. Because of the large volume of tests to perform, and the high cost to perform them, field testing should be phased-in over a 3 to 5 year time period. It is not possible to test all required units within a one year time frame. The Levels of Non-Compliance as written are on a per generator basis, and will not work well for entities that have a large number of generators. In addition, because the details of the requirements are left up to the RRO, the levels of non-compliance should be rewritten as proposed in the comments provided by the SERC Planning Standards Subcommittee (PSS).
Response: The drafting team believes and is supported by industry comment, that alternative methods for verification of data can be valid. The applicable methods are to be identified in the RRO's procedure. The commenter is encouraged to offer assistance in developing the regional			

Commenters	Reliability Need?	Acceptable Translation?	Comments
			procedures. The drafting team is proposing that the RRO have almost a year to become compliant with its requirements, with the Generator Owner becoming compliant a year after the RRO. This suggestion seems to be a compromise between the various suggestions provided by stakeholders. Note that the RRO's procedure must identify a schedule and periodicity for verifications so that even after the standard becomes effective, the RRO may not require all generators to begin supplying data at the same time. The objective is to have verified capability data from each generator that is required to provide data, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation.
Midwest Reliability Organization	Yes	Yes	D2. Levels of non-compliance. Where "some" is used for non-compliance, is it possible to define further? Response: 'Some' information missing simply means that the data reported was not complete. However, the levels of non-compliance were revised to avoid the use of the word, 'some'.
Entergy	Yes	Yes	The Levels of Non-Compliance as written are on a per generator basis, and will not work well for entities that have a large number of generators. In addition, because the details of the requirements are left up to the RRO, the levels of non-compliance should be rewritten as follows: 2.1. Level 1: Verified generator data were provided and were complete for less than 100% of a generator owner's units as required by the RRO procedures. 2.2. Level 2: Verified generator data were provided and were complete for less than 95% of a generator owner's units as required by the RRO procedures. 2.3. Level 3: Verified generator data were provided and were complete for less than 90% of a generator owner's units as required by the RRO procedures. 2.4. Level 4: Verified generator data were provided and were complete for less than 85% of a generator owner's units as required by the RRO procedures. Response: The objective is to have verified capability data from each generator that is required to provide data, whether an entity has one generator or many. Compliance violations should be reported so as to not unfairly characterize the extent of the violation.
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Raj Rana – AEP			Change the title as follows: Verification of Sustainable Generator Gross and Net Reactive Power Capability. The word Sustainable is added to differentiate between data used for power flow vs. stability studies. ---Reword D1.4 Additional Compliance Information as

Commenters	Reliability Need?	Acceptable Translation?	Comments
			follows: The Generator Owner shall demonstrate compliance through transmitting the verified data to Transmission Owner/Operator/Planner, and through self-certification or audit - - - - as determined by the Compliance Monitor. R2.1 - last phrase - "including generator terminal voltage limitations" - Consider: Maximum reactive power capability as a function of real output, as limited by generator bus voltage and/or auxiliary bus voltages.
			Response: The title has been revised. Sustainable is removed from the title, as there may be other applicable factors defined in the RRO procedure. The suggested modification to the 'Additional Compliance Information' is a requirement and not a method of assessing compliance. There are other types of limits that may be applicable; the standard is not intended to provide an exhaustive list.
Rebecca Berdahll – Bonneville Power Administration	Yes	Yes	
Karl Bryan – Corp of Engineers			
Jay Sietz – US Bureau of Reclamation			
Brenda Anderson			
Samuel W. Leach – TXU Power	Yes	Yes	
SERC EC Generation Subcommittee (GS)	Yes	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	

MOD-025-1 Verification of Generator Gross and Net Reactive Power Capability

Commenters	Reliability Need?	Acceptable Translation?	Comments
Alan Adamson – NYSRC	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	Yes	
Ed Riley – California ISO	Yes	Yes	
ISO/RTO Council Standards Review Committee	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Consolidated Edison	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team split MOD-023 and distributed the requirements for the RRO to develop procedures into the associated MOD-024 through MOD-027 standards. The drafting team recommends the RRO have almost a year to develop procedures relative to verifying reactive power capability. Based on the comments, the drafting team is recommending that the effective date for the Generator Owner to meet the requirements be delayed for a year beyond the date the RRO needs to complete its procedures for verifying reactive power capability. This should give Generator Owners sufficient time to work through the coordination needed to meet compliance.

While many commenters indicated this standard should be field tested before being implemented, most comments indicate that the field testing is needed to provide entities time to develop procedures and processes, not time to verify that the requirements and measures are appropriate or can be objectively measured, so the drafting team is not recommending field testing for this standard.

Commenters	Field Test Required?	Recommended Date?	Justification
Jerry Nicely – TVA Nuclear Generation John K. Loftis, Jr. – Dominion – Electric Transmission Tennessee Valley Authority	Yes Yes Yes		Recommend field testing for the purpose of coordinating this effort between Transmission Operators, Generator Operators, and Transmission Planners and development of appropriate procedures.
Response: The activities you've described should be achievable within the one year gap between the time the RRO's procedures must be completed and the time the Generator Owners must meet compliance.			
Resource Issues Subcommittee SERC EC Generation Subcommittee (GS)	Yes Yes		Recommend field testing for the purpose of coordinating this effort between Transmission Planners and development of appropriate procedures.
Response: The activities you've described should be achievable within the one year gap between the time the RRO's procedures must be completed and the time the Generator Owners must meet compliance.			
D. Byran Guy – Progress Energy, Inc.	Yes		Recommend field testing for the purpose of coordinating this effort between Transmission Operators, Generator Operators, and Transmission Planners and development of appropriate procedures. Field test inter- and intra- company coordination.
Response: The activities you've described should be achievable within the one year gap between the time the RRO's procedures must be completed and the time the Generator Owners must meet compliance.			

Midwest Reliability Organization	Yes		Delay necessary for method standardization in MOD-023-1. Additionally, field testing and/or some external evaluation and additional costs may be necessary.
Response: Some regions already require the Generators to verify reactive power capability, so there are established methodologies in place today. There is a full year's gap between the time the RRO must meet compliance in developing its procedures and the time the generator owner must meet compliance.			
Southern Company Generation Southern Company – Transmission	Yes Yes		Recommend field testing for the purpose of coordinating this effort between Transmission Operators, Generator Operators, and Transmission Planners and development of appropriate procedures. Various methods will be employed among different utilities and generators to do this verification. Some refinement in the processes and procedures are expected as experience is gained and should enhance the safety and reliability of the overall verification process. This supports the allowance of a reasonable period of time to achieve compliance.
Response: Some regions already require the Generators to verify reactive power capability, so there are established methodologies in place today. There is a full year's gap between the time the RRO must meet compliance in developing its procedures and the time the generator owner must meet compliance.			
Xcel Energy – Northern States Power	Yes	1/2008	This is an extension of MOD-023-1. At present, there is no industry-wide accepted criteria to perform this function, and the methodology would need to come from the respective RRO process described in MOD-023 - 1. Implementation and field testing could only take place after that.
Response: Some regions already require the Generators to verify reactive power capability, so there are established methodologies in place today. There is a full year's gap between the time the RRO must meet compliance in developing its procedures and the time the generator owner must meet compliance.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

MOD-028-1 Provision of Models and Data for Transmission Power Electronic Control Devices

Summary Consideration: Several commenters suggested that this standard is redundant with other already approved standards, specifically MOD-013 - Maintenance and Distribution of Dynamics Data Requirements and Reporting Procedures and MOD-012 - Dynamics Data for Modeling and Simulation of the Interconnected Transmission System.

MOD-013 is a Version 0 Standard that addressees the establishment of Regional requirements for reporting data needed for modeling and analyzing the dynamic response of the applicable Interconnection. MOD-013 R1 states:

MOD-013 R1. The Regional Reliability Organization, in coordination with its Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners, shall develop comprehensive dynamics data requirements and reporting procedures needed to model and analyze the dynamic behavior or response of each of the NERC Interconnections: Eastern, Western, and ERCOT. Within an Interconnection, the Regional Reliability Organizations shall jointly coordinate on the development of the data requirements and reporting procedures for that Interconnection.

MOD-012 is a Version 0 standard that requires entities to report their dynamics data to the RRO in accordance with the RRO's procedures:

> MOD-012 R1. The Transmission Owners, Transmission Planners, Generator Owners, and Resource Planners (specified in the data requirements and reporting procedures of MOD-013-0_R4) shall provide appropriate equipment characteristics and system data in compliance with the respective Interconnection-wide Regional dynamics system modeling and simulation data requirements and reporting procedures as defined in Reliability Standard MOD-013-0_R1.

The Drafting Team agrees with those commenters who indicated that the proposed MOD-028 is redundant with the already approved standards and suggests that MOD-028 be removed from the set of Phase III & IV Standards. There is no reason to treat the Transmission Power Electronic Control Devices any different from other equipment already addressed in MOD-013. This shall serve as a response to all comments submitted on MOD-028.

Entergy			(From Q 4 – Other comments) Please change "TPI-002" to "TPL-002" in the Purpose.
Joseph F. Buch – Madison Gas and Electric	No		

MOD-028-1 Provision of Models and Data for Transmission Power Electronic Control Devices

Commenters	Reliability Need?	Acceptable Translation?	Comments
Tennessee Valley Authority	No	No	Models are required to be verified only during commissioning tests. It is not clear what should occur if a change to a setting happens after this time. Model changes subsequent to setting changes should allow validation by design data. At some point in the future as more of these devices are installed on the system, they would become a reliability issue.
Mark Kuras NERC Interconnection Dynamics Working Group Multi-Regional Modeling Working Group	No Yes No	No No No	This standard is redundant with MOD-013-0 and should be deleted. Power electronic control devices should not be treated differently from other devices. If this standard is not deleted, it should be revised to require demonstration that the model adequately reproduce the dynamic response of the device and that user documentation be provided. Delete text under Additional Compliance Information because it is up to the region as to how compliance will be measured. This text adds nothing to the standard.
IESO – Ontario	No	No	MOD-10 and MOD-12 already cover these requirements. This standard is largely redundant and should be deleted. R1.1 , R1.2 and R3.1 and R3.2 are unique requirements that should be added to the other standards through an ordinary SAR process.
John K. Loftis, Jr. – Dominion – Electric Transmission	No	No	This proposed standard is redundant with MOD-013 and should be deleted. Power electronic devices should not be treated any differently than other devices. If this standard is not deleted, then it should be revised to require demonstration that the model adequately reproduces the dynamic response of the device, and that user documentation be provided.
Ed Riley – California ISO ISO/RTO Council Standards Review Committee	No No	No NO	MOD-10 and MOD-12 already cover these requirements. This standard is largely redundant and should be deleted. R1.1 and R1.2 are unique requirements that should be added to the other standards through an ordinary SAR process.
Kansas City Power and Light	Yes	No	Model and data is needed prior to the in-service date in order to perform the reliability study.

MOD-028-1 Provision of Models and Data for Transmission Power Electronic Control Devices

Commenters	Reliability Need?	Acceptable Translation?	Comments
Constellation Generation Group	Yes	No	Generator can only provide design data. Response to responses to frequency excursions can not be measured, frequency characteristic is unknown and can vary. How can generator come up with data?
SPP Transmission Working Group	Yes	No	Standard asked for preliminary model and data after in service date. You need the data to do reliability study once the control system is design, you ought to be able to get the data. Date should be changed to November 1, 2005 to be consistent with other standards.
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	The proposed date should be changed to November 1, 2005 to be consistent with the other standards.
Joseph D Willson – PJM	No	No	Level 3 adds a new requirement of “with sufficient time” that is not part of the standard’s requirement R1.1.
Individual Members of CCMC	Yes	No	Level 3 adds a new requirement of “with sufficient time” that is not part of the standard’s requirement R1.1 . M1 needs to be reworded to correct "with sufficient time" vagueness.
Peter Burke – American Transmission Co.	Yes	No	Following are suggested changes to various elements of this standard: A.3 "…models and data are provided to the Transmission Planner and Planning Authority..." (since PA is also responsible to perform assessments required per TPL-001 through TPL-004). R1.1 ...models, data, proposed settings, and any proposed operating strategies... R1.2 ...models, data, applied settings, and any adopted operating strategies... R2 ...at least every five years. M1.1 ...provided preliminary models, data, proposed settings, and any proposed operating strategies to TP and PA... M1.2 ...provided preliminary models, data, proposed settings, and any proposed operating strategies to TP and PA...

Commenters	Reliability Need?	Acceptable Translation?	Comments
			M2 ...operating strategies within the last five years... D2.2 ...evidence of MOD-028 M1.1 or MOD-028 M1.2 were not provided... D2.3 ...proposed settings and any proposed operating strategies were not provided to TP and PA...to allow analysis before... D2.4.1 ...proposed settings and any proposed operating strategies were not provided to TP and PA... D2.4.2 ...applied settings and any adopted operating strategies were not provided to TP and PA...
Transmission Issues Subcommittee	Yes	Yes	The standards drafting team should ensure that control models and data for more traditional devices such as switched capacitors are covered in other standards.
Midwest Reliability Organization	Yes	Yes	Correct proposed effective date under A5 from October 1 to November 1.
Gerald Rheault – Manitoba Hydro	Yes	Yes	Applicability: Standard should clarify specifically for what the TO and TOP each are responsible. There should be a requirement to document the settings and strategies for the Power Electronic Control Devices. M1: need to be more specific than "allowing enough time to perform studies of potential impacts".
FRCC	Yes	Yes	In R1.1. at "at least 60 days" into the requirement before "prior to their installation or change." The phrase in M1 "allowing enough time to perform studies of potential impacts before the new or changed, etc." is subjective and vague and should be clarified. M1 should then be changed to match the language in R1.1.
AEP			Reword the title as follows: Provision of Models and Data for Transmission Control Devices. This is to cover devices such as the GE variable frequency transformer (VFT). Modify R2 to read: …every five years, or sooner if any changes are made to the device or its control settings. Add to R1: The data shall be compatible with standard models available in stability

Commenters	Reliability Need?	Acceptable Translation?	Comments
			programs widely used in the industry. If a new model is necessary for reasonable representation of the equipment, the new model must be developed for industry-wide use. Add R1.3: – Any field changes made by the Transmission Owner or Transmission Operator to the verified data described above shall be re-verified / tested as soon as possible. Such changes, and their associated verification/testing results, shall be coordinated with the Transmission Owner/Planner, and reported to the region within 30 calendar days. D1.2 Compliance Monitoring Period and Reset Timeframe: At installation of new equipment. Beyond that, when equipment is changed out or when setting changes are made. (Once this data becomes established and there are no further equipment changes, it is unnecessary and burdensome to keep repeatedly doing compliance reviews.) D1.3 Data Retention: Generator Owner shall retain data indefinitely or until the device is retired. Delete D2.2 (Level 2 non-compliance)
Raj Rana – AEP	Yes	Yes	See AEP Comment
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	Suggested rewording of 2.1 of Levels of Non-Compliance as follows: "Transmission Power Electronic Control Device models, data, and settings were provided to the Regional Reliability Organization more than 30 days following the request."
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Deborah M. Linke – US Bureau of	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Reclamation			
Entergy	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
John Horakh – MACC	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
NPCC CP9 RSWG	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Cinod Kotecha	Yes	Yes	
Alan Adamson – NYSRC	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	
WECC Reliability	Yes	Yes	

MOD-028-1 Provision of Models and Data for Transmission Power Electronic Control Devices

Commenters	Reliability Need?	Acceptable Translation?	Comments
Subcommittee			
Kathleen Goodman – ISO-NE	Yes	Yes	
Gred Mason – Dynergy Generation	Yes	Yes	
Mohan Kondragunta – Southern California Edison	Yes	Yes	
Consolidated Edison	Yes	Yes	

MOD-028-1 Provision of Models and Data for Transmission Power Electronic Control Devices

Commenters	Reliability Need?	Acceptable Translation?	Comments

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team recommends MOD-028 be dropped from the set of Phase III & IV standards being developed. Commenters indicated that this standard is redundant with MOD-012 and MOD-013.

Commenters	Field Test Required?	Recommended Date?	Justification
Peter Burke – American Transmission Co.	Yes	March, 2006	Time needed to obtain and integrate the PEBC models and data into simulation programs and to validate their performance.

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-003-1 Regional Requirements for Analysis Transmission and Generation Protection System Misoperations

Joseph D Willson – PJM	No	No	If plan does not require any revisions R2 is never applicable.
Response: The standard was modified to clarify that the requirements must be distributed after approval – not just after approval of revisions.			
North Carolina Municipal Power Agency 1	No	No	NCMPA1 agrees with the need for having a standard that covers special protection systems for large generators on the transmission system. However, including small diesel generators that serve distribution systems in the scope of this standard will provide no benefits in maintaining the reliability of the interconnected trasmission system. Therefore, NCMPA1 suggests stating in this standard a minimum applicable capacity for the generators and/or a minimum applicable system voltage rating on which the generator resides. A reasonable position would be to exclude generators from this standard that have capacities less than 3 MW and/or reside on a system that is rated less than 69 kV.
Response: This standard applies to protection system misoperations and not Special Protection Systems. The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
Tennessee Valley Authority NERC System Protection and Controls Task Force	Yes Yes	No No	1. Standard is deficient — Needs a definition of protection systems — 2. Delete R1.6. because the standard needs a universal definition of misoperation. It is proposed that NERC consider implementing, as a starting point, the PSRC definitions outlined in the 1999 report: Transmission Protective Relay System Performance Measuring Methodology.— 3. Modify Purpose in Introduction to read: To ensure all transmission and generation protection system misoperations are analyzed for cause and corrective actions are developed and implemented. — 4. In R1.2 need to set minimum requirements for monitoring ALL operations, even possible correct ones, in order to ensure all misoperations have been identified. Need to set some minimum requirements for analysis, especially if no cause is found. 5. In Levels of Non-compliance, need to provide lower level of non-compliance since not addressing one requirement is certainly less severe than not even having a procedure.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			— 6. R1.2 – Append: as defined in R1.1. — 7. R1.4 – Append: as defined in R1.1.
Response: 1. The drafting team added a definition of protection system. 2. The drafting team added a definition of misoperation. 3. The purpose statement was modified in support of your suggestion. 4. Monitoring all operations is implied in the requirement to analyze misoperations because it is not possible to identify misoperations unless you review all operations. Because other standards require facility owners to comply with the Region's requirements, if this standard required the facility owners to analyze all operations, then facility owners would have to prove compliance and this would be very onerous. 5. The levels of non-compliance were modified to assign greatest weight to not having any requirements. 6. The standard was modified to clarify what was intended – the cross references to R1 are no longer needed for clarity.			
NERC Interconnection Dynamics Working Group	Yes	No	Modify Purpose to read: To ensure all transmission and generation protection system misoperations are analyzed for cause and corrective action are developed and implemented. — Modify R1.2 to read: Requirements for monitoring and analysis of all protective device misoperations for those transmission and generation prescribed in R1.1 — Move R1.6 up in the list to R1.2…logical organization.
Response: The purpose was modified to clarify what was intended and the phrase addressing maintenance was removed. The cross reference suggested (as prescribed in R1.1) is no longer needed for clarity. R1.6 was removed because the SDT added a definition of misoperations.			
Cinod Kotecha	Yes	No	The requirement in R1 should be limited to bulk power transmission

Commenters	Reliability Need?	Acceptable Translation?	Comments
Consolidated Edison Alan Adamson – NYSRC Kathleen Goodman – ISO-NE	Yes Yes Yes	No No Yes	
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
Kansas City Power and Light	Yes	No	The new requirement R1.1 does not add to the standard, and should be deleted.
Response: R1.1 was intended to narrow the scope of facilities addressed by the Region's procedures. This has been revised to clarify the intent.			
SPP Transmission Working Group	Yes	No	R1.1 and R1.2 contradict. R1.1 should be deleted . R1.6 should be R1.1.
Response: R1.1 and R1.2 were intended to narrow the scope of facilities addressed by the Region's procedures. These have been revised to clarify the intent. R1.6 was removed because the SDT added a definition of misoperations.			
Gred Mason – Dynergy Generation	Yes	No	1. Generation Owners and Transmission Owners should be added to Section 4, Applicability 2. Section B,R1 should be modified to read as follows:"…Each Regional Reliability Organization shall, in coordination with Generation Owners and Transmission Owners, develop…"Regions should be required to involve Generation Owners and Transmission Owners when establishing the required procedures.
Response: Most stakeholders seemed to agree that the Region should be responsible for the requirements in this standard. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements.			
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	1. What is the definition of a Compliance Monitor? 2. B. R1 Is the "Procedure" going to be the ECAR Documents? The 2005 ECAR Compliance Program Schedule notes Document 14 to reference for Standard PRC-

Commenters	Reliability Need?	Acceptable Translation?	Comments
			003. Document 11 actually mentions misoperations. 3. -R1 and R1.2 What is meant by "monitoring"? There is no mention of monitoring in PRC-004. Does this mean that the RRO is to have a procedure for monitoring or the utilities? 4. - D. 1. 1.3 Is the Compliance Monitor the RRO?
Response: 1. The Compliance Monitor was defined with V0 as follows: The entity that monitors, reviews, and ensures compliance of responsible entities with reliability standards. 2. This is a proposed NERC standard, not an ECAR Regional Document. The Drafting Team doesn't have specific knowledge of the ECAR standards. 3. Monitoring all protection system operations is implied in the PRC-003-1 standard which requires the analysis and reporting of misoperations. It is not possible to identify misoperations unless you review all operations. Note that the revised standard avoids use of the word, 'monitoring' to avoid confusion. 4. No – NERC is the Compliance Monitor for the RRO.			
Mark Kuras – MAAC	Yes	No	The second part of the Level 4 non-compliance seems a bit harsh. Recommend moving it down to Level Two and making Level 4 two or more requirements missing.
Response: The levels of non-compliance were all modified to improve their alignment with the requirements.			
Southern Company Generation	Yes	No	R1 - Need to clarify what is meant by "categories" of devices. Also, the term "all" as used here should be removed due to that it would imply no limitations. The scope of generator protection systems defined in the regional procedures should be reasonable (limited to only what is necessary.)
Response: The standard was revised to avoid use of the term 'categories' to avoid this confusion. The word, 'all' was removed as suggested. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements. The standard was revised to clarify that the protection systems examined are those that the Region identifies as having a potential impact on Bulk Electric System reliability.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Southern Company – Transmission	Yes	No	R1 - Need to clarify what is meant by -categories- of devices. Also, the term -all- as used here should be removed due to that it would imply no limitations. The scope of generator protection systems defined in the regional procedures should be reasonable (limited to only what is necessary.) What is intended by RRO reviewing -all- misoperations?
Response: The standard was revised to avoid use of the term 'categories' to avoid this confusion. The word, 'all' was removed as suggested. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of these requirements. The standard was revised to clarify that the protection systems examined are those that the Region identifies as having a potential impact on Bulk Electric System reliability.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson Deborah M. Linke – US Bureau of Reclamation	Yes Yes	Yes Yes	We suggest provision allowing the RRO to establish minimum generator and / or plant size for application of this standard.
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
Mohan Kondragunta – Southern California Edison	Yes	Yes	SCE suggests that the Standard specify that the RRO identify minimum generator and plant size to apply this standard.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
FRCC	Yes	Yes	Re-word the beginning of R1.1. to be consistent with the structure used in the standard. Remove "The procedure shall identify" and replace with "Identification of".
Response: R1 was extensively revised so that implementing this suggestion is no longer relevant.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	1. Purpose: Remove "and maintenance and testing programs" since the requirements do not deal with maintenace and testing. 2. R2:Add the word "establish and" before "maintain document". 3. Also, change "within 30 calendar days of the approval of a revision" to "within 30 calendar days of approval of the document or subsequent revision".
Response: 1. The purpose statement was revised as suggested. 2. The intent of this suggestion is supported in the revised standard. 3. The intent of this suggestion is supported in the revised standard.			
Xcel Energy – Northern States Power	Yes	Yes	R1.2 Delete the word "all", as it is too prescriptive and takes away the RRO's capability to establish exemption criteria where appropriate.
Response: The word, 'all' was removed as suggested.			
Michael C. Calimano – NYISO	Yes	Yes	The Requirement in R1 should be limited to only Bulk Electric System to limit the scope of the review.
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
NPCC CP9 RSWG	Yes	Yes	The Requirement in R1 should be limited to only Bulk Power Transmission.
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
Ed Riley – California ISO	Yes	Yes	The Requirement in R1 should be limited to only Bulk Electric System
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
IESO – Ontario ISO/RTO Council Standards Review Committee	Yes Yes	Yes Yes	The Requirement in R1 should be limited to only Bulk Electric System. We recommend moving it the second part of the Level 4 compliance down to Level 2 and making Level 4 two or more requirements missing. This would be more appropriate for the severity of the non-compliance
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System. The levels of non-compliance were all adjusted to improve their alignment with the requirements.			
Doug Hohbough – First Energy Corp.	Yes	Yes	The side-by-side comparison does not show a Level 1 non-compliance. The clean draft version shows a level one non-compliance. Not sure which is correct.
Response: The clean version was the correct version.			
WECC Reliability Subcommittee			WECC RS suggests that the Standard specify that the RRO identify minimum generator and plant size to apply this standard.
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	
Midwest Reliability Organization	Yes	Yes	
Entergy	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
John Horakh – MACC	Yes	Yes	
Raj Rana – AEP	Yes	Yes	
Peter Burke – American Transmission Co.	Yes	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Samuel W. Leach – TXU Power	Yes	Yes	
PPL Corporation	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Individual Members of CCMC	Yes		
Howard Rulf - WE Energies	Yes	Yes	
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-004-1 Analysis and Mitigation of Transmission and Generation Protection System Misoperations

Entergy			(From Q 4 – Other comments) We suggest Levels of Non-Compliance 2.1 and 2.3 be interchanged since "mitigation plans is incomplete" is in item 2.4 but not in 2.2.
Response: The levels of non-compliance were modified to better align with the requirements of the standard.			
Pacific Gas and Electric			Any misoperation of nuclear protection systems would be evaluated as part of the plant corrective action program.
Response: If a misoperation of a nuclear protection system is evaluated as part of a plant corrective action plan, then that plant corrective plan **might** also meet the requirements of the Region for a mitigation plan. The fact that a misoperation is evaluated as part of a plant corrective action program does not preclude the need to also meet the requirements of this standard. The Drafting Team encourages you to work with your Region(s) to look for opportunities to provide input into the establishment of the Regional requirements specified under the proposed PRC-003-1.			
North Carolina Municipal Power Agency 1	No	No	NCMPA1 agrees with the need for having a standard that covers special protection systems for large generators on the transmission system. However, including small diesel generators that serve distribution systems in the scope of this standard will provide no benefits in maintaining the reliability of the interconnected trasmission system. Therefore, NCMPA1 suggests stating in this standard a minimum applicable capacity for the generators and/or a minimum applicable system voltage rating on which the generator resides. A reasonable position would be to exclude generators from this standard that have capacities less than 3 MW and/or reside on a system that is rated less than 69 kV.
Response: This standard applies to protection system misoperations and not Special Protection Systems. The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
Barry Green – Ontario Power Generation	Yes		There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, PRC-004-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case,

Commenters	Reliability Need?	Acceptable Translation?	Comments
			the appropriate entity to meet the requirements.
Response: The Functional Model is not clear as to which entity is responsible for the requirements in this standard. Because there is a financial investment associated with mitigation plans, the Drafting Team defaulted to assigning these requirements to the Generator Owner. The Generator Owner may delegate the tasks to the Generator Operator. This is similar to the way corresponding protection & control standards assign responsibilities to the Transmission Owner.			
NERC System Protection and Controls Task Force	Yes	No	Standard is deficient — 1. Needs definitions of protection systems and misoperations — It is proposed that NERC consider implementing, as a starting point, the PSRC definitions outlined in the 1999 report: Transmission Protective Relay System Performance Measuring Methodology.— 2. The April 11, 2005 version seemed to leave out Generator Owners that own transmission protection systems. But the April 21, 2005 version includes it by stating: the Transmission Owner, Generator Owner, and Distribution Provider that owns a transmission or generator protection system. The April 21 version should be retained. – – 3. R1 and M1 are non specific as to the size of the generator for which a relay misoperation needs to be analyzed. Requiring a formal analysis for minor misoperation on relatively small generating units is burdensome and unnecessary.
Response: 7. The drafting team added a definition of protection system and misoperation. 8. The proposed standard applies to all generator owners since all generator owners own some protection systems. This is a broadening of the scope of applicability, not a narrowing of the scope of applicability. 9. Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations is limited to those protection systems that have an IMPACT on the Bulk Electric System.			
Ronnie Frizzell - Arkansas Electric Coop. Corp. SPP Transmission Working Group	Yes Yes	No No	4.2 Version 0 drafting team recognized that there are generation owners that owned relays that were involved in the protection of the transmission system. I disagree with the proposed deletion.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The proposed standard applies to all generator owners since all generator owners own some protection systems. This is a broadening of the scope of applicability, not a narrowing of the scope of applicability.			
Joseph F. Buch – Madison Gas and Electric	Yes	No	The requirements and measures state that the protection system owner shall(has) develop(ed) and impement(ed) a mitigation plan to avoid future misoperations. One can learn from the misoperation and implement a plan to prevent misoperations of a similar nature. However not all misoperations can be prevented. Suggest that this be reworded to state "..shall develop and implement a mitigation plan to prevent or reduce the frequency of occurrence of misoperations of a similar nature.
Response: The intent of this suggestion was adopted – and the phrase, 'of a similar nature' was added as suggested.			
Cinod Kotecha Consolidated Edison Alan Adamson – NYSRC	Yes Yes Yes	No No No	The requirement in R1 should be limited to bulk power transmission.
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations is limited to those protection systems that have an IMPACT on the Bulk Electric System.			
FRCC	Yes	No	1. PRC-016 SPS Misoperation analysis should be merged into PRC-004, with the same requirements as PRC-004. 2. In R2, remove (within 30 calendar days). In PRC-003 R1.3, the RRO must describe the periodicity and R2 should not preclude the RRO from establishing different reporting requirements. 3. Levels of Non-Compliance (1, 3 and 4) each refer to PRC-003 R1. It is inappropriate to refer to requirements in other standards. The levels of non-compliance should only address measures in this standard.
Response: 1. There are many acceptable ways of sorting the requirements in the set of Phase III & IV Standards. Most stakeholders seemed to accept having separate requirements for SPS Misoperations – so the drafting team did not adopt this suggestion.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
2. The reference to 30 calendar days was removed from Requirement 2 as suggested. 3. There are several standards that include cross references to other standards. If the RRO fails to develop and distribute its requirements relative to transmission and generation protection system misoperations (PRC-003), then the entities identified in PRC-004 can't be held accountable for compliance.			
Joseph D Willson– PJM	Yes	No	These levels are not appropriate. Compliance should be based of this standard's requirements, which it is not. Either eliminate R2 and M2 or move these to PRC-003. This standard should not have requirement obligations from another standard.
Response: Compliance is based on entities complying with this standard's requirements. However this standard's requirements are that the responsible entity meet the obligations developed by the Region under PRC-003. The Drafting Team does not support moving Requirement 2 and Measure 2 to PRC-003. PRC-003 is an associated standard because it sets the foundation for PRC-004 – however PRC-003 is applicable to the RRO and PRC-004 is applicable to facility owners.			
Southern Company – Transmission Southern Company Generation	Yes Yes	No No	1. R1 & M1- Recommend that SDT clarify and state what is meant with the statement -implement a mitigation plan to avoid future misoperaitons- . Wouldn't it read better to say -implement a mitigation plan in an effort to prevent future misoperations-. 2. R2 & M2- Recommend that SDT clarify and state what is meant with the term -mitigation plan-. Does it mean the same as in R1? 3. D.1.3 - Recommend replace -and accompanying mitigation plans- with -corrective actions-.
Response: 1. Requirement 1 and Measure 1 were modified to include the following phrase, "…to avoid future misoperations of a similar nature." This supports your suggestion. 2. The drafting team added a definition of mitigation plan. 3. The drafting team avoided using the term, 'corrective actions' in recognition that it may take quite some time to organize an outage to make adjustments to generator protection systems. The term, 'corrective actions' seems to infer that the actions will be imminent – and that isn't the case for generator protection systems.			
Greg Ludwicki – Northern Indiana	Yes	No	-D. 1. 1.3 No need to mention "The Compliance Monitor shall retain any audit data for three

Commenters	Reliability Need?	Acceptable Translation?	Comments
Public Service Co.			years." It was mentioned in PRC-003.
Response: The data being retained in PRC-003 is different from the data being retained in PRC-004. In addition, the data being retained by the Compliance Monitor under PRC-003 is being retained by NERC – the data being retained by the Compliance Monitor under PRC-004 is being retained by the RRO.			
Individual Members of CCMC	Yes	No	These levels are not appropriate. Compliance should be based of this standard's requirements, which it is not. This standard should not have requirement obligations from another standard. This creates a situation where two standards are dependent on each other. If one is not compliance, the second cannot be audited. Either eliminate R2 and M2 or move these to PRC-003. This standard should not have requirement obligations from another standard. This creates a situation where two standards are dependent on each other. If one is not compliance, the second cannot be audited..
Response: Compliance is based on entities complying with this standard's requirements. However this standard's requirements are that the responsible entity meet the obligations developed by the Region under PRC-003. The Drafting Team does not support moving Requirement 2 and Measure 2 to PRC-003. PRC-003 is an associated standard because it sets the foundation for PRC-004 – however PRC-003 is applicable to the RRO and PRC-004 is applicable to facility owners.			
Mark Kuras – MAAC	Yes	No	Under data retention, the misoperation information and mitigation plans should be kept for at least 2 years. Switch Level 3 text with Level 1 text. Mitigations plans are more important than misoperation reports.
Response: It isn't clear why you've recommended retaining misoperation information and mitigation plans for at least two years. It seems that keeping the mitigation plan through its execution should be sufficient, and this is what is being proposed. The levels of non-compliance were all modified.			
Mohan Kondragunta – Southern California Edison	Yes	Yes	SCE suggests that the Standard specify that the RRO identify minimum generator and plant size to apply this standard. In addition, it is recommended that Section A.3 be revised to read: "… transmission and generation protection system misoperations affecting the Bulk Electric System are analyzed for …"

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations is limited to those protection systems that have an IMPACT on the Bulk Electric System.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson Deborah M. Linke – US Bureau of Reclamation			We suggest provision allowing the RRO to establish minimum generator and/or plant size for application of this standard.
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations are limited to those protection systems that have an IMPACT on the Bulk Electric System.			
WECC Reliability Subcommittee	Yes	Yes	WECC RS suggests that the Standard specify that the RRO identify minimum generator and plant size to apply this standard.
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations is limited to those protection systems that have an IMPACT on the Bulk Electric System.			
Michael C. Calimano – NYISO	Yes	Yes	The Requirement in R1 should be limited to only Bulk Electric System to imit the scope of the review.
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations are limited to those protection systems that have an IMPACT on the Bulk Electric System.			
NPCC CP9 RSWG Kathleen Goodman –	Yes Yes	Yes Yes	The Requirement in R1 should be limited to only Bulk Power Transmission.

Commenters	Reliability Need?	Acceptable Translation?	Comments
ISO-NE			
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations is limited to those protection systems that have an IMPACT on the Bulk Electric System.			
IESO – Ontario	Yes	Yes	The Requirement in R1 should be limited to only Bulk Electric System
Ed Riley – California ISO	Yes	Yes	Level 1 compliance and level 3 are opposite. Switch level 3 and level 1 text. Mitigation plans are more important than reporting misoperations..
ISO/RTO Council Standards Review Committee	Yes	Yes	
Response: Under PRC-003 Requirement 1, the RRO's requirements for analyzing protection system misoperations are limited to those protection systems that have an IMPACT on the Bulk Electric System. All the levels of non-compliance were modified to better align with the requirements.			
Doug Hohbough – First Energy Corp.	Yes	Yes	Differences exist in R2 side-by-side comparison and the clean draft
Response: There were some format errors that were added when converting the 'mapping' version with the 'clean' version of the standard. We'll try to avoid those in the future.			
Peter Burke – American Transmission Co.	Yes and No	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
Entergy	Yes	Yes	
Karl Kohlrus - City Water, Light &	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Power			
Samuel W. Leach – TXU Power	Yes	Yes	
John Horakh – MACC	Yes	Yes	
Raj Rana – AEP	Yes	Yes	
PPL Corporation	Yes	Yes	
SERC EC Generation Subcommittee (GS)	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
Xcel Energy – Northern States Power	Yes	Yes	
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	
Kansas City Power and Light	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Constellation Generation Group	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	Yes	
Gerald Rheault – Manitoba Hydro	Yes	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	
Midwest Reliability Organization	Yes	Yes	
Gred Mason – Dynergy Generation	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-005-1 Transmission and Generation Protection System Maintenance and Testing

Pacific Gas and Electric			Nuclear facilities have a documented maintenance program.
Response: This standard does not eliminate the need to meet other requirements established by other entities – hopefully a single maintenance program will meet the requirements of both programs.			
North Carolina Municipal Power Agency 1	No	No	NCMPA1 agrees with the need for having a standard that covers special protection systems for large generators on the transmission system. However, including small diesel generators that serve distribution systems in the scope of this standard will provide no benefits in maintaining the reliability of the interconnected trasmission system. Therefore, NCMPA1 suggests stating in this standard a minimum applicable capacity for the generators and/or a minimum applicable system voltage rating on which the generator resides. A reasonable position would be to exclude generators from this standard that have capacities less than 3 MW and/or reside on a system that is rated less than 69 kV.
Response: This standard applies to protection system misoperations and not Special Protection Systems. The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System.			
NERC System Protection and Controls Task Force	Yes	No	This standard is too weak to be meaningful. An entity could have a program that simply states that they will do demand maintenance upon known problems together with the procedure, etc, and they would conform to this standard. It needs to be strengthened in the future. — Is run-to-failure an adequate maintenance/testing program? If not, what are the minimum requirements?
Response: Please be more specific in identifying the weaknesses in the standard.			
FRCC	Yes	No	PRC-008 UFLS Maintenance Program, PRC-011 UVLS Maintenance Program, and PRC-017 SPS Maintenance Program should be merged into PRC-005. The R1 requirements are the same and the UFLS, UVLS, SPS identification can be designated in R1.1. These programs should all be consolidated into one standard. In D2, Levels of Non-Compliance - Combine Level 1 and Level 2 into a single Level of Non-Compliance so that existing Level 1 OR existing Level 2 becomes the new Level 1. A

Commenters	Reliability Need?	Acceptable Translation?	Comments
			situation where the documentation being complete but the implementation is behind schedule (existing Level 1) may or may not be a worse situation than the documentation being incomplete but the implementation of that portion is on schedule.
Response: There are many ways of sorting the requirements in these standards. The drafting team felt that merging all the V0 standards addressing maintenance and testing may delay obtaining approval – and since the reorganization would not result in any increased reliability, the drafting team did not adopt this suggestion. The levels of non-compliance were modified in support of your suggestion.			
Constellation Generation Group	Yes	No	Need more specifics on tests required, procedures, schedules, etc. expected. Scope is unclear and possibly too broad,
Response: The intent of the standard is to establish the requirement to perform and document maintenance and testing, not to describe 'how' to accomplish this.			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	Numbering in section 4 needs to be corrected to 4.1, 4.2 etc instead of 1.1, 1.2. 1.2 Version 0 drafting team recognized that there are generation owners that owned relays that were involved in the protection of the transmission system. I disagree with the proposed deletion.
Response: The numbering has been corrected. The scope of applicability has been expanded (not reduced) to include all generator owners – those that own transmission protection systems and those that own generator protection systems affecting the Bulk Electric System.			
SPP Transmission Working Group	Yes	No	Version 0 drafting team recognizes that there are generation owners that owned relays that were involved in the protection of the transmission system. Disagree with proposed deletion.
Response: The scope of applicability has been expanded (not reduced) to include all generator owners – those that own transmission protection systems and those that own generator protection systems affecting the Bulk Electric System.			
Kenneth Dresner – FirstEnergy Solutions	Yes	No	The requirements under R1.1 are to specific and also to general things like batteries and communications are too general for implemetation What is the definition of an instrument transformer? This could be considered too general

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: R1.1 was modified. The Drafting Team developed a definition for protection systems, and was able to eliminate the list in R1.1. The term, 'instrument transformer' is no longer used in the standard.			
NPCC CP9 RSWG Kathleen Goodman – ISO-NE Cinod Kotecha	Yes Yes Yes	No No No	R1.2 We suggest that documentation of specific maintenance Criteria be defined by the Regions.
Response: Facility Owners are in the best position to manage the details of their maintenance and testing programs.			
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	1. Could the definition of generator protection system include a specific voltage class to use for a break point when determining which protection devices should be included? I would recommend a generator's terminal voltage be the break point. R1.4 requests schedule for system testing and R1.5 schedule for system maintenance. 2. Can a clarification be provided to differentiate the specific tasks of testing and maintenance? When is testing not maintenance and vice versa? Instrument Transformer: 3. B. R1. R1.1.2 What transformers are we talking about? How do you want them tested.? This could take a lot of time and create risk depending on what transformers are being referred to. What is the expected benefit? 4. - I interpret requirement for an annual open circuit response test. Recommend a longer time frame unless operational anomalies are encountered.
Response: 1. The purpose clarifies that this standard is limited to protection affecting the Bulk Electric System. 2. The standard was modified to reflect that maintenance and testing are integrated tasks. 3. The term, 'transformers' is no longer used in the standard. 4. This is not an accurate interpretation of the requirements.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Consolidated Edison Alan Adamson – NYSRC	Yes Yes	No No	In reference to the applicability and requirements for TOs, there should be reference to voltage classification, or whether this applies to Bulk Power System elements only. In reference to the applicability and requirements for GOs there should be reference to size of generation, or whether this applies to Bulk Power System elements only. Under Requirements R2, the documentation required should be described or clarified. This clarification should state whether the documentation is a written description in paragraph form, or the copy of the organization's entire relay maintenance file.
Response: The standard has been revised to clarify that R1 is limited to transmission and generation protective systems that **IMPACT** the Bulk Electric System. By keeping the requirement more general, we aren't requiring any specific type of documentation - and this results in entities not having to change the way they document their maintenance and testing programs today. The intent is to minimize the need to change the way entities do things, unless that change results in increased reliability.			
Mark Kuras – MAAC	Yes	No	R1.4 and R1.5 should be removed. Compliance should look at the end product only not how it is accomplished. Concern about slight slippage of the schedule and non-compliance. In R1.6, is this last test of the program or of the relays? Text seems to imply the program.
Response: The requirements were modified in support of your suggestions.			
Ed Riley – California ISO ISO/RTO Council Standards Review Committee	Yes Yes	No No	Documentation of specific maintenance Criteria should be defined by the Regions. R1.4 and R1.5 should be dropped. Schedules are irrelevant, as long as the testing between intervals is completed.
Response: Facility Owners are in the best position to manage the details of their maintenance and testing programs. Your recommendation to drop R1.4 and R1.5 was adopted.			
Doug Hohbough – First Energy Corp.	Yes	No	Not sure what the distinction is between schedules for system maintenance and schedules for system testing. Recommend that R1.4 and R1.5 be combined. Seems like Levels 1 and 2 non-compliance should refer only to PRC-005 R1 the way they are currently worded. PRC-005 R2 does not deal with the schedule for system maintenance

Commenters	Reliability Need?	Acceptable Translation?	Comments
			and testing.
Response: Your recommendation for merging the references to maintenance and testing was adopted. The revised standard requires the facility owner to define maintenance and testing 'intervals' and to perform those tasks within those 'intervals'. Conforming changes were made to the levels of non-compliance.			
John Horakh – MACC	Yes	No	Delete (not) in the last line of D.2.2, delete D.2.4.1 numbering not needed.
Response: The levles of non-compliance were modified to better align with the revised requirements and measures. The suggestions are no longer applicable.			
Individual Members of CCMC	Yes	No	Levels 1, 2, and 3 have an additional requirement "was not on schedule" which is not part of the standard's requirement. These statements must be removed. Compliance should be based on "adherence" to schedule or days.
Response: The revised standard requires the facility owner to define maintenance and testing 'intervals' and to perform those tasks within those 'intervals'. Conforming changes were made to the levels of non-compliance.			
Joseph D Willson– PJM	Yes	No	Levels 1, 2, and 3 have an additional requirement "was not on schedule" which is not part of the standard's requirement. These statements must be removed.
Response: The revised standard requires the facility owner to define maintenance and testing 'intervals' and to perform those tasks within those 'intervals'. Conforming changes were made to the levels of non-compliance.			
Joseph F. Buch – Madison Gas and Electric	Yes	Yes	With possibly only a few minor changes this standard should be able to be implemented per the schedule proposed.
Response: Thank you.			
Xcel Energy – Northern States Power	Yes	Yes	The term "Generation Protection System" needs to be defined. The magnitude of a generation maintenance and testing program escalates exponentially if Balance of Plant items become a part of this Standard.
Response: The Drafting Team did develop a definition of 'Protection System' that is applicable to both generator protection systems and			

Commenters	Reliability Need?	Acceptable Translation?	Comments
transmission protection systems. This standard was modified to clarify that it is only applicable to PSs that affect the reliabiltiy of the Bulk Electric System.			
Barry Green – Ontario Power Generation	Yes		There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, PRC-005-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case, the appropriate entity to meet the requirements.
Response: The Functional Model is not clear as to which entity is responsible for the requirements in this standard. Because there is a financial investment associated with mitigation plans, the Drafting Team defaulted to assigning these requirements to the Generator Owner. The Generator Owner may delegate the tasks to the Generator Operator. This is similar to the way corresponding protection & control standards assign responsibilities to the Transmission Owner.			
IESO – Ontario	Yes	Yes	Documentation of specific maintenance Criteria should be defined by the Regions. This should be included in R 1.2. R1.4 and R1.5 should be dropped. Schedules are irrelevant, as long as the testing between intervals is completed.
Response: Facility Owners are in the best position to manage the details of their maintenance and testing programs. The revised standard requires the facility owner to define maintenance and testing 'intervals' and to perform those tasks within those 'intervals'.			
WECC Reliability Subcommittee Mohan Kondragunta – Southern California Edison	Yes Yes	Yes Yes	WECC RS suggests that the Standard specify that the RRO identify minimum generator and plant size to apply this standard.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: This standard was modified to clarify that it is only applicable to Protection Systems that affect the reliabiltiy of the Bulk Electric System.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	Include the RRO as the body that will coordinate the minimum generator and plant size for stand application.
Response: This standard was modified to clarify that it is only applicable to PSs that affect the reliabiltiy of the Bulk Electric System.			
Southern Company Generation	Yes	Yes	M2 – The reference to PRC-003 is incorrect. We believe this should be PRC-005.
Response: The typographical error was corrected.			
Southern Company – Transmission	Yes	Yes	M2 has a reference to R2 of PRC-003. This should be R2 of PRC-005. Revise R1.5. Corrective action taken to (address or reduce a) misoperation or failure to operate from reoccurring.
Response: This comment is more applicable to R1.4 in PRC-003 which deals with misoperations. PRC-003 requires the RRO to develop requirements for mitigation plans which are intended to prevent similar misoperations from occurring.			
Gred Mason – Dynergy Generation	Yes	Yes	1. Section A4,1.2 has a typo-need to eliminate"…that owns."
Response: The qualifying language is needed in A4.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	
PPL Corporation	Yes	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	Yes	
Gerald Rheault – Manitoba Hydro	Yes	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	Yes	
Midwest Reliability Organization	Yes	Yes	
SERC EC Generation Subcommittee (GS)	Yes	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Tennessee Valley Authority	Yes	Yes	
Raj Rana – AEP	Yes	Yes	
Deborah M. Linke – US Bureau of	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Reclamation			
Peter Burke – American Transmission Co.	Yes	Yes	
Samuel W. Leach – TXU Power	Yes	Yes	
Entergy	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Kansas City Power and Light	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Howard Rulf - WE Energies	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	

PRC-023-1 Redundancy of Transmission Protection Systems

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-023-1 Redundancy of Transmission Protection Systems

Summary Consideration:

While most stakeholders who commented on this standard indicated that there is a reliability need for a standard to address this topic, the same stakeholders also indicated that this standard, as written, is not acceptable as a reliability standard. The purpose of the standard is to ensure that protective devices operate for all faults on the BES, but the requirements are aimed at specifying one solution to achieve this goal, not on the desired performance. In addition, the references to Reliability Standards TPL-001 through TPL-004 added confusion because these standards already address one facet of redundancy in Table 1.

The Drafting Team recommends that the Planning Committee investigate this topic and draft a new SAR aimed at achieving the desired performance. This shall serve as a response to all comments submitted on this standard.

Pacific Gas and Electric			A3 The purpose should be expanded to include no single protection system component failure shall result in the loss of both nuclear power plant offsite power interconnections.
FRCC	No	No	Delete this standard. Redundancy requirements are already specified in Table 1, footnote e of Standards TPL-003-0 and TPL-004-0.
Southern Company – Transmission Southern Company Generation	No No	No No	This Standard would be too expensive to implement and would be unduly burdensome. Recommend removing this standard.
Kansas City Power and Light	Yes	No	This requires redundant system protection on every new or upgraded system protection scheme for bulk transmission. Could be scaled back to this type of reduncancy only on critical facilities.
Consolidated Edison Alan Adamson – NYSRC	Yes Yes	No No	In Requirements, it states that each TO shall provide protection system redundancy with each new or upgraded Bulk Electric System protection system installation. The standard should address instances where physical limitations of existing installations prevent meeting all the applicable criteria items.
NERC System Protection and	Yes	No	The SPCTF believes the standard does not sufficiently address the differing needs of redundancy of today's protection systems. The standard will eventually have to be rewritten due to the widely varying capabilities of digital relays and electro-mechanical relays. The

Commenters	Reliability Need?	Acceptable Translation?	Comments
Controls Task Force			objective should be that: For any single common mode failure within the protection system, sufficient backup must be available such that faults are cleared within the system protection performance requirements and adequate load-carrying capabilities are maintained. Where redundancy in the protection systems due to single protection system component failures is necessary to meet the system performance requirements the transmission or protection system owners shall implement the protection scheme with the following redundant items: Protective Relays – The transmission element will be protected by two relay systems (System) where each is independently capable of performing the protective functions. The overall protection design should minimize the risk of both Systems being disabled simultaneously by a single event or condition AC Current Inputs – The relay current sensing elements of each System are to be supplied by separate current transformer secondary windings. AC Voltage Inputs – The relay voltage sensing elements of each System where both, or all, of the redundant relays require ac potential to determine directionality, are to be supplied by separate voltage transformer secondary windings from the potential devices. DC Voltage – The DC control and power supply voltages (if required) for each System are to be supplied by separately fused circuits and coordinated with upstream circuit protection. Communication Channels – Where communications aided tripping is required to meet the system performance requirements, each System is to be supplied by an independent communications channel. Breaker Failure – The breaker failure function need not be duplicated, however, each System is to independently initiate the breaker failure protection function.
Mark Kuras – MAAC	No	Yes	The concept of redundancy is dealt with somewhat in TPL-002 through TPL-004. It should be made clearer in those standards and then this standard can be deleted. Need to consider the performance consequences when a non-redundant primary protection system fails. Redundancy is not required for TPL-001 so delete the reference. Section 2 Levels of non-compliance are not written as requirements for redundancy but requirements for documentation. I don't think that was intended. Move tect for Level 3 in Section 3 to Level 4.

PRC-023-1 Redundancy of Transmission Protection Systems

Commenters	Reliability Need?	Acceptable Translation?	Comments
WECC Reliability Subcommittee Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson Deborah M. Linke – US Bureau of Reclamation Mohan Kondragunta – Southern California Edison	Yes Yes Yes Yes	No No No No	There appears to be an inconsistency between the redundancy requirement of this standard and TPL-003. For example, C8 in Table 1 specifically allows for a protection system failure for a single contingency. Does the redundancy requirement apply to TPL-002? WECC RS believes this standard is confusing as written. If failure of a primary protection scheme results in the same performance level as with the backup scheme, why would an entity put the redundant scheme in as part of the primary proctetion? If performance can be met with a backup scheme, is a redundant scheme necessary?
Gerald Rheault – Manitoba Hydro	Yes	No	This proposed standard should be guideline for design of protection systems. Redundancy should not be mandated. If a standard is required, the requirement should be that for a single common mode failure, the protection system must operate to clear a fault such that the system performance requirements in TPL-002, 003 & 004 are met. R1.1: Clarify what is meant by separate ac current inputs. Is it acceptable to supply each relay system from a separate secondary winding of a current transformer? Do breaker failure relays and line protections require separate ac supplies? R2: Is a separate plan for reviewing the need for redundancy required? Seasonal and long term assessments already required by the NERC standards, assess system performance based on knowledge of protection characteristics.
Response:			

PRC-023-1 Redundancy of Transmission Protection Systems

Commenters	Reliability Need?	Acceptable Translation?	Comments
Doug Hohbough – First Energy Corp.	Yes	No	This standard needs to reflect the differences in the level of work required to develop and implement requirements for evaluating new or upgraded facilities versus the work required to develop and implement requirements for evaluating and implementing upgrades for existing facilities. This topic deserves to have separate standards for RRO responsibilities and the TO responsibilities. The TOs should not be expected to do evaluations until RRO requirements are developed. Those two standards should have different implementation dates.
John Horakh – MACC	Yes	No	Delete R1.3 because the list is (at a minimum). Eliminate R1.4 numbering, just keep as part of R1. Delete (those entities responsible for the reliability of the interconnected transmission system) in R2, M1, M2.
Joseph D Willson– PJM	No	No	This standard must not include provisions of another standard as its requirements. R1 must be re-written. Also the standard should address performance expectations and not redundancy.
Individual Members of CCMC	Yes	No	This standard must not include provisions of another standard as its requirements. R1 must be re-written. Also, the standard should address performance expectations and not redundancy. This is an old measurement that in theory was absorbed in the TPL standards. This standard would give ways or options to modify relay schemes if a TPL assessment shows that the entity cannot meet performance requirements. The use of the word "incomplete" needs to be defined.
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	No	-B. R2. R2.1 could be moved to B. R2 for the 30 day response.
Cinod Kotecha	Yes	Yes	The standard should not be too prescriptive because there may be physical limitations that may not allow redundancy measures to be implemented.
Entergy John K. Loftis, Jr. – Dominion – Electric	Yes Yes	Yes Yes	Insert the following at the end of the first sentence in R2: as stated in PRC-023 R1.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Transmission SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	
Raj Rana – AEP	Yes	No Answer	
ISO/RTO Council Standards Review Committee	Yes	Yes	
NPCC CP9 RSWG	Yes	Yes	
Tennessee Valley Authority	Yes		
Xcel Energy – Northern States Power	Yes	Yes	
IESO – Ontario	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Kathleen Goodman – ISO-NE	Yes	Yes	
SPP Transmission Working Group	Yes	Yes	

PRC-023-1 Redundancy of Transmission Protection Systems

Commenters	Reliability Need?	Acceptable Translation?	Comments
Howard Rulf - WE Energies	Yes	yes	
Michael C. Calimano – NYISO	Yes	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
Peter Burke – American Transmission Co.	Yes	Yes	
Midwest Reliability Organization	Yes	Yes	
Ed Riley – California ISO	Yes	Yes	
Gred Mason – Dynergy Generation	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: The drafting team recommends PRC-023 be dropped from the set of Phase III & IV standards being developed because commenters indicated that there is a disconnect between the purpose and the requirements that can't be resolved without a new SAR. This summary consideration shall serve as a response to all comments submitted on this question.

Commenters	Field Test Required?	Recommended Date?	Justification
Midwest Reliability Organization	Yes		Transmission Owners may need additional time to install necessary equipment to comply with the standard.
Doug Hohbough – First Energy Corp.	Yes		TOs and RROs need time to develop the details for the implementation of this standard. There needs to be separate schedules for the requirements for new or upgraded facilities and for existing facilities. RRO requirements must be developed first.
NERC System Protection and Controls Task Force	Yes		This standard needs to be field tested after it is rewritten to address concerns of SPCTF. The resultant standard will be complicated and we will need to judge the benefits of the complexities
Tennessee Valley Authority	Yes		This will create tremendous overhead on personnel, analysis, and documentation. The standard will be complicated and we need to judge the benefits of the complexities.

Commenters	Reliability Need?	Acceptable Translation?	Comments

PRC-019-1 Coordination of Generator Voltage Regulator Controls with Unit Capabilities and Protection

Southern Company Generation			(From Q 4 – Other comments) General Comment on PRC-019: Historically, very few generator device coordination problems have been identified. Since this is a new standard and historical trends don't indicate widespread problems in this area, it is recommended that NERC and the regions address the generator device coordination on a priority basis and allow ample time for the industry to come into compliance. Allowing up to seven years for existing systems to be completed should allow a reasonable amount of time for the coordination to be performed and implemented.
Response: Stakeholder comments have supported reliability need for coordination of voltage regulators. The drafting team is proposing to phase in generator compliance monitoring during a period 1/1/08 to 1/1/12. This will allow industry time for implementation, since the requirements will be new for most generators.			
Southern Company – Transmission			(From Q 4 – Other comments) General Comment on PRC-019: Historically, very few generator device coordination problems have been identified. Since this is a new standard and historical trends don't indicate widespread problems in this area, it is recommended that NERC and the regions address the generator device coordination on a priority basis and allow ample time for the industry to come into compliance. Allowing 2-3 years for existing systems to be completed should allow a reasonable amount of time for the coordination to be performed and implemented.
Response: Stakeholder comments have supported reliability need for coordination of voltage regulators. The drafting team is proposing to phase in generator compliance monitoring during a period 1/1/08 to 1/1/12. This will allow industry time for implementation, since the requirements will be new for most generators.			
IESO			(From Q 4 – Other comments) We suggest deleting 'manufacturer's' in the following sentence: "The generator 'manufacturer's' reactive capability curve…"

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The term 'manufacturer's' was removed as requested.			
FRCC	Yes	No	This standard is asking for a great deal of information in a poorly defined format. The standard should address misoperation, miscalibration or miscoordination of the generator overexcitation protection. The standard should be re-written to focus on controls and protection systems during times when lagging reactive output could cause system concerns.
Response: The standard was extensively modified in an attempt to add more clarity to the requirements. Please review the revised standard and see if the additional clarity will make the requirements in this standard acceptable to you. The drafting team is limited to addressing requirements that are within the scope of the approved SARs. The commenter is encouraged to submit a SAR to address issues that are outside the scope of the Phase III & IV measures.			
Kansas City Power and Light	Yes	No	It appears that this standard is redundant
Response: The drafting team does not believe the standard is redundant with other standards. The commenter is encouraged to be more specific regarding where the redundancy is perceived to occur.			
Joseph F. Buch – Madison Gas and Electric	Yes	No	Generation to transmission interconnection agreements on var output may preclude field demonstration of the capability curve and the standard should recognize these occurrences. Also, while the standard provides for a 5 year phase in of the requirements, thereafter annual calendar year evaluation seems excessive. The capabilities of the units tend to be quite stable with little change over time. The need for annual evaluation should not be required. As part of the phase in period, the provision for field testing of this standard should include analysis of exceptions to these requirements for selected generators (<50 MW) or those of older vintage).
Response: The compliance language and requirements have been clarified and there is no requirement for an annual evaluation. The requirements were modified to indicate that the information must be updated at least once every 5 years or when there is a change to the information. The one-year reset period means that if an entity is found non-compliant then the violation is reset to zero after one year.			
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	No	PRC-019-1 language needs major work. It would appear that the intent is to reduce all generator protection down to a single sheet of paper. It is unclear as to whose benefit, the Generator Owner or the combination of Regional Reliability Organization, NERC, and the Transmission Operator. Is the Generator Owner to supply the requested information only following a request (original IIICM8 wording) or supply it within 5years and then wait and

Commenters	Reliability Need?	Acceptable Translation?	Comments
			show proof within 30 days of being asked for verification? With regard to requirement R1.1.3 it is up to the system studies entity to develop the steady state stability limit information for each generator bus and supply it to the Generator Owner.
Response: The standard does not require generator protection to be shown on a single sheet of paper. The intent is to document that generator voltage regulator controls and limit functions are coordinated with the generator's actual capabilities and protection systems. This is important to reliability, as it ensures the plant is able to operate in support of bulk electric system reliability. The standard has been clarified to indicate that the review must be completed at least once each five years. The reference to 30 days is only regarding the provision of documentation upon request. R1.1.3 has been removed as requested – this information is determined by the transmission planner.			
Entergy	Yes	No	The scope of this standard is significantly greater than was in the original. The cost/benefits of including these additional items should be considered. Any retained item should be clarified as to what is actually required.
Response: There is industry support of the reliability need for this standard. There is additional detail in the draft standard regarding what information is required, but the scope is consistent with the Phase III-IV measure. The commenter is encouraged to comment on any specific sub-requirements that are inappropriate.			
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson Deborah M. Linke – US Bureau of Reclamation	Yes Yes	No No	We believe the draft represents a substantially expanded scope of the standard. The draft employs the use of the generator capability curve to plot several characteristics that were not specified in the original version of the standard. This specified format will require substantial resource and time to compile. In addition some of the characteristics are not typically plotted on the capability curve or plotted at all. The standard requires numerous data to be plotted that will clutter and impact the usability the capability curves. Another concern; we believe the draft overlaps considerably with standard FAC-009 Establish and Communicate Facility Ratings. For example this standard asks for the MW limit of the prime mover, the MVA rating of the step-up transformer, and any other limit that could restrict the MW or MVA output. As stated this includes ambient temperature impact, river flow requirements, and environmental restrictions. We recommend the drafting team reexamine the amount of information to be provided to the Transmission Operator and consider reducing it to a few basic items.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: There is industry support of the reliability need for this standard. There is additional detail in the draft standard regarding what information is required, but the scope is consistent with the Phase III-IV measure. The commenter is encouraged to comment on any specific sub-requirements that are inappropriate. The facility rating data in FAC-009 is a simplified representation of capability for modeling, while PRC-019 provides more details necessary to confirm coordination of protection and controls. PRC-019 was revised to narrow the list of information to be provided.			
IESO – Ontario	Yes	No	Questions are raised whether the intention of this standard has gone beyond the scope of the original Planning Standard IIICM8. We suggest that SDT should re-consider the inclusion of this standard (in its present form) into Phase III/IV planning standards. It may be more appropriate to introduce and issue PRC-019-1 as a separate new standard (via SAR process).
Response: There is industry support of the reliability need for this standard. There is additional detail in the draft standard regarding what information is required, but the scope is consistent with the Phase III-IV measure. The commenter is encouraged to comment on any specific sub-requirements that are inappropriate.			
SERC EC Generation Subcommittee (GS)	Yes	No	The scope of this standards is significantly greater than was in the original and seems excessive. A more limited set of requirements will provide evidence of adequate coordination.
Jerry Nicely – TVA Nuclear Generation	Yes	No	Delete R1.1.6, 1.1.7, 1.1.4, 1.4, and 1.1.3.
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	No	Clarify R1.3. Delete NERC from the first sentence in R1 and delete the words unless exempted from the second sentence in R1.
Response: There is industry support of the reliability need for this standard. There is additional detail in the draft standard regarding what information is required, but the scope is consistent with the Phase III-IV measure. The commenter is encouraged to comment on any specific sub-requirements that are inappropriate. The drafting team has reduced the list of elements under 2.1, addressing several of the items the comment requested be dropped. The requirement to identify any other limit that could restrict the MW or Mvar capability (1.1.4) has been retained. Requirement 1.3 for Volts / Hertz settings was modified to require that the generator owner either provide a plot or data that could be plotted to show the volts-per-hertz protection settings including volts-per-hertz limiters in the automatic voltage regulator. NERC has been deleted as a recipient of the information from the Generator Owner.			
Gred Mason – Dynergy Generation	Yes	No	1. The requirements in section B,R1.1.1, B,R1.1.4, B,R1.3 and B,R1.4 are new(or at least more specific) relative to the current standard and should be eliminated if the current standard is just being "translated. "If these requirements are retained, significant additional

Commenters	Reliability Need?	Acceptable Translation?	Comments
			work will be required to obtain the data. 2. Section B,R1.1.6 should be revised to read: "Out of step impedance relays(if applicable)." 3. Section B,R1.3-Change the word "settings" to ""relays" in order to focus on design rather than actual settings. 4. Section B,R1.4-Strike the words"…secure settings for the…" to focus on design rather than actual settings. 4. Levels of Non-Compliance are too stringent. Suggest modifying these to making Level 4 tied to not addressing 4 of the 12 requirements in R1.
Response: The drafting team has revised and narrowed the list of elements in R2.1 to be more specific so that they are better understood. While the drafting team was charged with 'translating' the Measures from the Phase III & IV Planning Standards, this translation doesn't have the same constraints as the 'translation' associated with translating the Operating Policies and Planning Standards into Version 0 standards. The objective of Version 0's translation was to make a complete translation of the existing Operating Policies and Planning Standards, without adding any new requirements. Minor modifications were allowed to identify the functional model entity responsible for each requirement, and to organize the requirements so they followed a consistent format. The Operating Policies and Planning Standards addressed during the Version 0 translation were considered to be complete and had received stakeholder acceptance and BOT adoption. The Phase III & IV Planning Measures weren't complete and hadn't received final stakeholder and BOT approval – and most of the Phase III & IV Measures needed modification before they were acceptable to stakeholders. The requirement to plot the out of step characteristics was removed from the revised standard. 'Volts/Hertz settings' was modified to, 'Volts-per-hertz protection settings'. This supports the intention of your suggestion. R1.4 has been deleted. The drafting team disagrees the levels of non-compliance are too stringent – the levels of non-compliance were modified to align with the modifications made to the requirements and measures and the revised level four is tied to not addressing 2 or more of six requirements. This is the same % as you suggested.			
Southern Company – Transmission	No	No	The scope of this standard is significantly greater than was in the original IIIC.M8 standard and is excessive. The scope should be contained to showing coordination of the -voltage regulator control and limit functions with the generator's capabilities and protective relays-. On this basis, we recommend deletion of R 1.1.4, R 1.1.6, R 1.1.7, R 1.4. Clarify R1.2 and R1.3 as noted below. R1.2 should be clarified to state -When so equipped, minimum excitation limiter coordinates with the generator's underreactive capability and the loss of excitation or loss of field relay

Commenters	Reliability Need?	Acceptable Translation?	Comments
			characteristic(s).- R1.3 should be clarified to state, -When so equipped, the V/Hz limiter coordinates with the generator and/or GSU V/Hz capabilities and the V/Hz protective relay(s).- All generators are not equipped with all protective system devices and excitation system limiters and devices listed here. This standard should not dictate what protection features are required, which is a matter better suited for the generator owner and transmission provider. Delete NERC from the first sentence in R1 and M1. If this standard is implemented as written, recommend 5 of the most critical units be tested per year due to the significant amount of cost and resource requirements to accomplish testing, data verification, etc.. The accomplishment of this should be coordinated with Standard MOD-026. It is impractical for a Utility with many large generating units to accomplish this requirement in a short time period. Under D1.2: Annual submission of this much information is unnecessary because these settings do not change that often. A 5 year resubmission is more reasonable.
Response: There is industry support of the reliability need for this standard. The list of information required has been narrowed and refined to be consistent with the Phase III-IV measure. The drafting team has reduced the list of elements under 1.1, addressing several of the items the commenter requested be dropped. R1.2 was deleted. R1.3 (now R2.1.6) has been clarified. NERC was deleted from R1. There is no requirement to submit the data annually. R1 was revised to clarify the review must be completed as the equipment changes or reviewed once every five years. The drafting team is recommending a six-year phase in of compliance monitoring (1/1/08 to 1/1/12 for Generator Owner Requirements) to allow time for implementation across all generators – 20% of generators per year.			
Southern Company Generation	No	No	The scope of this standard is much greater than in the original IIIC.M8 standard and is excessive. The scope should be contained to show coordination of the "voltage regulator

Commenters	Reliability Need?	Acceptable Translation?	Comments
			control and limit functions with the generator's capabilities and protective relays". On this basis, we recommend deletion of R 1.1.4, R 1.1.6, R 1.1.7, R 1.4. Clarify R1.2 and R1.3 as noted below: R1.2 should be clarified to state "When so equipped, minimum excitation limiter coordinates with the generator's underreactive capability and the loss of excitation or loss of field relay." R1.3 should be clarified to state, "When so equipped, the V/Hz limiter coordinates with the generator and/or GSU V/Hz capabilities and the V/Hz protective relay(s)." Not all generators are equipped with all protective system devices and excitation system limiters and devices listed here. This standard should not dictate what protection features are required; it is better suited for the Gen Op and Trans. Provider. Delete NERC from the 1st sentence in R1 and M1. Due to the significant amount of cost and resource requirements to accomplish testing, etc., it is recommended that Compliance D1.1.2 be changed to say "Initial seven year calendar year phase-in period, then one calendar year". This standard should be coordinated with Standard MOD-026.
Response: There is industry support of the reliability need for this standard. The list of information required has been narrowed and refined to be consistent with the Phase III-IV measure. The drafting team has reduced the list of elements under 1.1, addressing several of the items the commenter requested be dropped. R1.2 was deleted. R1.3 (now R2.1.6) has been clarified. NERC was deleted from R1. There is no requirement to submit the data annually. R1 was revised to clarify the review must be completed as the equipment changes or reviewed once every five years. The drafting team is recommending a six-year phase in of compliance monitoring (1/1/08 to 1/1/12 for Generator Owner Requirements) to allow time for implementation across all generators – 20% of generators per year. MOD-026 does not have any requirements that are dependent upon PRC-019.			
John Horakh – MACC	Yes	No	Purpose should be: To insure that a generator's reported capability is coordinated with its voltage regulator controls and limit functions and protective relays.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			In R1.4, replace (secure) with (coordinated)
Response: R1.4 has been removed. The drafting team has revised the purpose.			
NERC Interconnection Dynamics Working Group	Yes	No	The stated purpose of the new standard is: "To ensure generator voltage levels, reactive flows, and reactive resources are controlled and maintained within limits in real time to protect equipment and the reliable operation of the Interconnection." To achieve this, the various elements of this proposed standard include plotting on the static MW-MVAR generator capability curves, various AVR dynamic over- and under-excitation curves, loss-of-excitation relaying coordination, dynamic out-of-step relaying coordination, generator back-up relaying. Also volts/hertz relaying, back up voltage constrained overcurrent, negative sequence, and under- and over-frequency relaying are mentioned which could trip the generator. Such a diverse coordination should be viewed in real time operation when the generator operates at various loads under varying system conditions of voltage and frequency, connected through a network of varying strength, to other generators with varying dynamics. While it is normal practice to provide static MW-MVAR generator capability curves showing generator and turbine MW and MVAR limits, and to impose on it various AVR dynamic over- and under-excitation curves, adding the various other protection functions and coordination in a NERC standard, without other standards or guidelines such as IEEE/ANSI that could be referenced, would make the NERC standard ambiguous and indefensible. Hence more work needs to be done by way of NERC white papers or guidelines to answer questions that will be invariably asked by those attempting to comply with the new NERC standard. Many organizations assume that AVR controls and protection coordination is inherent – thus, methods to demonstrate protection and AVR coordination should be clearly stated. IDWG therefore suggests the following: 1. Create a new SAR that will provide procedures and guidelines for generator protection and AVR controls coordination. Various elements in this proposed standard could be used. 2. Ensure that all capability limits are established by calculations and verified by generator model validation. 3. If "maximum and minimum excitation limiters" (R1.1.1) is meant to be over- excitation and under-excitation limiters, state it as such. 4. The under-excitation area of operation includes an area of unstable operation. The

Commenters	Reliability Need?	Acceptable Translation?	Comments
			practical problems in validation of under-excitation limiter settings should be identified. 5. Include over-excitation limiters in R1.2. 6. Delete the theoretical steady state stability limit in R1.1.3 as it is not a practical limit to be considered when the dynamic limits prevail. 7. The out-of-step relaying calculation (R1.1.6) is often performed with static analysis. Its performance is however dynamic and requires a dynamic stability analysis not covered by existing standards. This should be deleted or specific procedures provided. 8. Simply providing relay settings (in R1.1.7 and R1.4) does not ensure adequate coordination with possible transmission system excursions. This would be perhaps better covered in proposed standard VAR-004-1, which would result in defined transmission system excursions for which the generator relays would be expected to be set to ride through. 9. Introduce a new R1.5 stating that "The capability Curve should show additionally curves for operation of +/- 5% voltage levels that the generator is capable of operating according to ANSI Standards." 10. The procedures in the new SAR should also address exemption criteria and phase in periods as appropriate. Exemptions weaken standards.

Response:

The purpose statement has been narrowed and clarified to better reflect the requirements, no longer addressing coordination in real-time.

1. The IDWG is encouraged to submit the SAR for any additional requirements necessary after reviewing the revised draft. The IDWG should note that a SAR would not be necessary for it to develop procedures or guides, only new standards.
2. The validation of the data is covered by MOD-023 to MOD-027. This standard addresses coordination.
3. R1.1.1 (now R2.1.2) has been clarified as requested.
4. Coordination of UEL with stability limits will address IDWG comment 4.
5. R1.2 was deleted.
6. Stability limit was removed as requested in IDWG comment 6.
7. Out-of-step relaying calculation was deleted (IDWG comment 7). This standard addresses coordination of generator protection with generator controls and capabilities.

Commenters	Reliability Need?	Acceptable Translation?	Comments
8. IDWG comment 8 is addressed in VAR-004 (now PRC-024). 9. The capability curve is a PQ curve, not a VQ curve. Voltage level does not change the generator capability curve. 10. The standard was revised to add a requirement for the RRO to identify exemption criteria.			
Tennessee Valley Authority	Yes	No	Requirements are not clear and if requirements are retained, they need to be field tested.
Response: The drafting team has narrowed and clarified the requirements. The drafting team is proposing a six-year phase in of compliance monitoring to allow time for implementation.			
Mark Kuras – MAAC	Yes	No	Any exemption criteria must be clearly stated and not be done on a case by case basis.
Response: The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. This is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs.			
Pacific Gas and Electric			R1 Some generator voltages limits are restricted by plant auxiliary bus voltages and not generator capabilities. M1 30 days is insufficient time to schedule and prepare a calculation.
Response: The comment regarding R1 is relevant to setting voltage schedules (addressed in VAR-001), but does not affect R1 as stated in the first draft of PRC-019. 30 days refers only to providing the documents upon request. The drafting team is proposing to phase in the compliance monitoring over six years, with a five-year review cycle.			
Joseph D Willson – PJM	Yes	No	R1 is incorrect: individual generators cannot be exempt from a standard. If a region has a classification of units that the standard does not need to apply to then that classification must be shown under section E. Regional Differences.
Response: The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs.			
SPP Transmission Working Group	Yes	No	R1 - what is the reasoning that a generator would be exempt ? This is a direct translation but it is relevant. Generator operator should be added to the Applicability section. Why does the generator

Commenters	Reliability Need?	Acceptable Translation?	Comments
			owner need to report this to NERCF? This is a direct translation but is it necessary since the GO/GOP report to the RRO ? Purpose - IN REAL TIME should be removed. R1.1 - Third sentence, no standard that requires RRO to define requirements.
Response: The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. The drafting team believes that the generator owner is accountable for protection coordination in the functional model. NERC has been removed from R1. Real-time coordination was removed from the purpose.			
Howard Rulf - WE Energies	Yes	No	R1.1.4 Define "GSU" in this standard and/or add it to the "Glossary of Terms Used in Reliability Standards". R1.1.6 Out of step relaying has a dynamic characteristic and is not applicable to the steady state generator reactive capability curve. R1.2.1 Minimum excitation limit is a component of the Automatic voltage regulator and as such is not coordinated with it. M1 There is too much imformation required in this standard to be available within 30 days of a request. 90 days would be more appropriate.
Response: GSU is an acronym for 'generator step up transformer' – and this is not used in the revised standard. Out of step relaying removed from requirements. R1.2 was deleted. The standard has been clarified to show a six-year phase in and a five-year review cycle. The 30 days refers only to providing the information upon a request. The generator should already have the information prepared.			
WECC Reliability Subcommittee Mohan Kondragunta – Southern California Edison	Yes Yes	No No	WECC RS suggests rewording R1.1.6 to read Out of Step Characteristics. WECC SR would like clarification on R1.2.1 and R1.2 What does coordination mean and how is it documented.

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: Out of step has been removed. R1.2 has been removed.			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	No	IIICM8 -- calls for the coordination of controls with the capabilities and relays of the generating unit. The proposed purpose changes the perspective of the standard from one of planning (coordination) to one of operations ("in real time"). Was this the intent? If so the requirements still imply coordination, which I believe to be the real intent. All this to say the phrase "in real time" causes me heartburn. The GO or GOP may do the coordination Generator Operator should be added to the Applicability section. R1 -- what is the reasoning that a generator would be exempt? This is a direct translation but is it relevant? Why does the generator owner need to report this to NERC? Again this is a direct translation but is It necessary since the GO/GOP report to the RRO?
Response: The purpose has been revised to reflect the scope of the standard, which does not include real-time coordination. The generator owner is accountable, whether the task is delegated to the generator operator. The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. An example would be exemption based on size that is so small as to be irrelevant to the bulk electric system. NERC has been removed from R1.			
NERC System Protection and Controls Task Force	Yes	No	The purpose of this standard should explicitly define coordination as it pertains to this standard. The applicable Reliability Coordinators must have the same information as the regions and generators. — It should be made clear that this standard applies only to transmission-connected generation, contrasted to distributed generation.— R1 implies that a Generator Owner may be exempted by the Regional Reliability Organization. All Generator Owners, without exception, should be required to meet this requirement. — R1.2: As item R1.3.1 states the purpose of the V/Hz protection, an item should be added below R1.2, stating that the MEL and loss-of-excitation protection protect (1) the generator rotor from damage due to induced currents in the rotor when excitation is drawn from the power system, and (2) the power system from large MVAR drain and low voltage when

Commenters	Reliability Need?	Acceptable Translation?	Comments
			generators (especially large units) draw their excitation from the power system. — All generator protective relays should coordinate with transmission system protection (e.g., generator backup distance / negative sequence, GSU neutral OC backup; also generator 81UF with system UFLS, etc.). R1.4 is a declarative sentence with no requirements. — D1.2: Annual submission of this much information is unnecessary because these settings do not change that often. A 5 year resubmission is more reasonable.
Response: The drafting team believes the intent of coordination is defined in the requirements themselves. The SPCTF is invited to submit a SAR for a new definition if it believes it is necessary. The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. An example would be exemption based on size that is so small as to be irrelevant to the bulk electric system. R1.2 was removed. R1.4 was removed. The standard has been clarified to show a six-year phase in and a five-year review cycle. The 30 days refers only to providing the information upon a request. The generator should already have the information prepared. The one-year reset refers only to resetting of violations.			
ISO/RTO Council Standards Review Committee	Yes	Yes and No	Questions are raised whether the intention of this standard has gone beyond the scope of the original Planning Standard IIICM8. It may be more appropriate to reintroduce and issue PRC-019-1 as a separate new standard (via the SAR process)
Response: The drafting team has narrowed and refined the requirements to make the scope consistent with the Phase III-IV measure.			
SERC EC Planning Standards Subcommittee (PSS)	Yes	Yes	The scope of this standard is significantly greater than was the original. The cost/benefits of including these additional items should be considered. Any retained item should be clarified as to what is actually required.
Response: The drafting team has narrowed and refined the requirements to make the scope consistent with the Phase III-IV measure.			
Raj Rana – AEP	Yes		This is a complex subject. We suggest that first a white paper be prepared and then the standard be field tested. This may lead to drafting a new SAR. Existing draft is overly

Commenters	Reliability Need?	Acceptable Translation?	Comments
			proscriptive.
Response: The drafting team has narrowed and refined the requirements to make the scope consistent with the Phase III-IV measure. The requester is invited to prepare the white paper or SAR as appropriate.			
Barry Green – Ontario Power Generation	Yes		There is some inconsistency in this package of standards affecting generators, between applicability to generator owner in some cases and generator operator in others. For this standard, PRC-019-1, the applicability must lie with the generator operator. In many cases, the owner, by virtue of contractual obligations, would not have the ability to carry out the obligations imposed by this standard. In other cases, ownership could be shared and it would not be appropriate for these obligations to be shared. Therefore, the applicability of this standard more correctly belongs with the generation operator. Alternatively, if NERC chooses to be less prescriptive, it could, for the purposes of the standard, place an obligation on the owner or operator, with an obligation on the region to clarify in each case, the appropriate entity to meet the requirements.
Response: The drafting team believes the functional model makes the generator owner accountable, whether the task is delegated to the generator operator or not.			
Peter Burke – American Transmission Co.	Yes	Yes	Inconsistent Language in R1.1.1: Note that the phrase as applicable is used in the translation mapping document but the phrase as appropriate is used in the clean draft 1 standards document.
Response: The drafting team will ensure the redline and clean copies are consistent in the next posting.			
PPL Corporation	Yes	Yes	PPL agrees that Regional Reliability Organizations must allow for exemptions for certain classes of generation units, as appropriate. It is felt that all units under 70 MWs should be exempt from these standards due to minimal effects on the system.
Response: The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs.			
Midwest Reliability Organization	Yes	Yes	Recommend that NERC develop a guide to assist Generator Owners for developing the requested curves required in R1. R1.1. Change "plotted, or in a form" to "plotted, or be provided in a form".

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The guide could be developed outside the standard, but is not part of the standard itself. IEEE J5 Working Group is working on the guide. The following phrase is used in the revised standard, “Plots, or data that could be plotted for the following:”. This supports your suggestion.			
Gerald Rheault – Manitoba Hydro	Yes	Yes	Purpose: The purpose statement does not appear to be reflected in the requirements. The purpose should be to "ensure coordination of the genarator controls with the generators capabilities and protection to ensure that generator tripping does not occur when the generator is operating within capabilities. R1: there should not be exemptions for this coordination requirement. R1.1.4 also add GUS tap range to the list in the brackets.
Response: The purpose statement has been modified to be consistent with the requirements. The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. An example would be exemption based on size that is so small as to be irrelevant to the bulk electric system. The list of items in R1.1.4 are just examples and not an inclusive list.			
Xcel Energy – Northern States Power	Yes	Yes	Which standard contains the requirement by an RRO to develop exemption criteria and procedures as described in R1? R1.1.6 - Should state "Generator Out-Of Step Relay", not just "out-of step" R1.2.1 - In practice the Automatic Voltage Regulator provides the Minimum Excitation Limit by its setting. The purpose of this requirement is not clear. Our interpretation of this is that it should coordinate with the Loss of Excitation curve of the Generator, and the requirement should state that. R1.3 Should state "The Volts/Hertz relay settings", not just "The Volts/ Hertz settings".
Response: The requirement for the RRO to identify any exemption criteria was in the original Planning Measures and is consistent with several other standards that allow the RRO to identify exemption criteria based on regional needs. This is R1 in the revised PRC-019. R1.1.6 was deleted. R1.2 was deleted. The term, ‘Volts/Hertz settings’ was revised to, ‘Volts-per-hertz protection settings..’. This supports the intent of your suggestion.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
Doug Hohbough – First Energy Corp.	Yes	Yes	R1.1 "The generator manufacturer's reactive capability curve is consistent with the generator current capability" What if it isn't?
Response: The generator owner would be obligated to ensure the capability curve is consistent with actual capability. The term 'manufacturer' has been removed.			
D. Byran Guy – Progress Energy, Inc.	Yes	Yes	R1 - Delete "NERC". Also delete "Unless exempted…" in last sentence to not be repetitive with first sentence in R1. R1.1 - Revise the first sentence to read: "The generator reactive capability curve used shall be consistent with the generator's existing capability." The scope of this standard is significantly greater than was in the original and seems excessive. A more limited set of requirements will provide evidence of adequate coordination. The following characteristics are not necessary for coordination and should be deleted from requirements specifically, delete R1.1.3 (steady state stability limit) and R1.1.6 (out of step) R1.1.7 (generator backup distance relay)
Response: NERC was removed from R1. R1 was edited to become a requirement for the RRO to identify any generator exemption criteria. R1.1 was clarified. The drafting team has deleted R1.1.3, R1.1.6, and R1.1.7 as requested.			
Transmission Subcommittee			PRC-019-1, M1, TS recommends including Generator Operator in M1. TS Recommendation: Once "Reactive Capability of Generation Unit(s)" is established the criteria needs to be defined to coincide with R3 when the voltage and reactive schedule is not maintained by each generator within the reactive capability of the unit. Does the PRC-019 capture the reporting requirements?
Response: The drafting team believes the functional model makes the generator owner accountable, whether the task is delegated to the generator operator or not. The drafting team believes the recommendation is addressed in VAR-002 – the comment is not relevant to PRC-019 because it does not address real-time coordination. Reporting requirements have been clarified.			
NPCC CP9 RSWG	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Ed Riley – California ISO	Yes	Yes	
Individual Members of CCMC	Yes		
Cinod Kotecha	Yes	Yes	
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	
Alan Adamson – NYSRC	Yes	Yes	
Constellation Generation Group	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
Kathleen Goodman – ISO-NE	Yes	Yes	
Michael C. Calimano – NYISO	Yes	Yes	
Samuel W. Leach – TXU Power	Yes	Yes	
Karl Kohlrus - City Water, Light &	Yes	Yes	

PRC-019-1 Coordination of Generator Voltage Regulator Controls with Unit Capabilities and Protection

Commenters	Reliability Need?	Acceptable Translation?	Comments
Power			
Consolidated Edison	Yes	Yes	

Comments on Field Testing and Effective Date

Summary Consideration: Based on the comments, the drafting team is recommending that the effective date for the Generator Owner to meet the requirements be delayed beyond the date the RRO needs to identify generator exemption criteria. The drafting team is recommending that the Generator Owner become compliant over a 5 year period, beginning a year after the RRO identifies its generator exemption criteria.

While many commenters indicated this standard should be field tested before being implemented, most comments indicate that the field testing is needed to provide entities time to become compliant, not time to verify that the requirements and measures are appropriate or can be objectively measured, so the drafting team is not recommending field testing for this standard.

Commenters	Field Test Required?	Recommended Date?	Justification
Gred Mason – Dynergy Generation	Yes	7/1/07	First,per MOD-023-1 the Regions are required to determine generating unit exemption criteria to the data requirements(allow 6 months).Then for the affected units,since this standard has several new(or at least more specific requirements) it will require significant time and effort to go through data in archives to document the information(allow one year).
Response: The drafting team is recommending that the Generator Owner become compliant over a 5 year period, beginning a year after the RRO identifies its generator exemption criteria.			
Tennessee Valley Authority SERC EC Planning Standards Subcommittee (PSS) Entergy John K. Loftis, Jr. – Dominion – Electric Transmission	Yes Yes Yes Yes		The requirements of this standard are not clear. They appear to require an enormous amount of work which may not be practical. Therefore, field testing is recommended.
Response: The drafting team made modifications to this standard to clarify the requirements. Please let us know if you still feel the requirements need field testing.			
Midwest Reliability Organization	Yes		This standard is complex and potential significant delays may be incurred obtaining the data. Requesting NERC guidance in methodology for obtaining the data.
Response: The drafting team is recommending that the Generator Owner become compliant over a 5 year period, beginning a year after the RRO identifies its generator exemption criteria.			
Raj Rana – AEP	Yes	11/0/05	The subject is complex. Prepare a white paper to facilitate field testing. White paper and field testing experience may lead to drafting a new SAR.

Response: Most commenters did not see a need for field testing this standard. The drafting team made modifications to this standard to clarify the requirements. Please let us know if you still feel the requirements need field testing.			
Xcel Energy – Northern States Power	Yes	1/2007	Based on our previous comment on PRC-019-1, the RRO must establish exemption criteria prior to implementation of this Standard for compliance by the Generator Owners
Response: The drafting team is recommending that the effective date for the Generator Owner to meet the requirements be delayed beyond the date the RRO needs to identify generator exemption criteria.			

Commenters	Reliability Need?	Acceptable Translation?	Comments

VAR-004-1 (Re-numbered as PRC-024) Generator Performance during Temporary Frequency and Voltage Excursions

Pacific Gas and Electric			These requirements should not result in increased trip risk or turbine damage
Response: The drafting team agrees – The drafting team encourages the commenter to participate in the regional process to develop that procedure and help identify the RRO's exemption criteria.			
AEP			This standard is needed for reliability. But, it requires significant work to draft a standard that will provide proper balance between system need (for the generator to remain connected) and the generator equipment need (to avoid unnecessary damage). Several points are presented below for the drafting team to consider: 1. Prepare a white paper and then draft a new SAR. The white paper will facilitate the understanding of this complex technical issue and will provide guidance regarding specific technical issues that need to be addressed in the new SAR. 2. The generating unit must be allowed to operate continuously in 59.5-60.5 Hz range. 3. A generating unit must not trip for normally cleared transmission faults that do not isolate the unit (e.g. for a three-phase fault at the generating station) 4. It may be adequate to have a standard that requires reporting of generating unit trip points and the associated time delays, rather that for the Regions to dictate ride through requirements. 5. Requiring the regions to devise standards and exception criteria may not be a worthwhile endeavor. In fact, most existing generation, including most new CT and CC units, already has acceptable survivability for both frequency and voltage excursions because experienced generator manufacturers generally understand power system requirements. 6. Frequency Issue: The generator must not trip before the last stage of UFLS. 7. Voltage Issue: A big problem on voltage ride through appears on older units whose over-excitation protection/limiting functions either trip exciter, or transfer from automatic to manual at some preset excitation level. Such units ought to be retrofitted with state-of-the-art equipment. The state-of-the art on excitation systems has improved to the point where units should not have difficulties in surviving most voltage excursions. However, I/we acknowledge that requiring generator owners to retrofit old excitation equipment may be

Commenters	Reliability Need?	Acceptable Translation?	Comments
			more than this standard could reasonably achieve.
Response: The requester is invited to submit a SAR to expand the scope as proposed. The scope of the current project is to translate the previous Phase III-IV planning standards. The drafting team believes item 2 is addressed in R1.1 and R1.2. Item 3 has been added to R1.4. Regarding items 4 and 5, the drafting team disagrees and believes the region needs to set generator ride-through requirements for the region. Item 6 has been added to the draft standard as R2.1. Regarding item 7. The drafting team encourages the commenter to participate in the regional process to develop that procedure and help identify the RRO's exemption criteria. There are many items to be considered in developing the RRO's requirements and exemption criteria and the drafting team encourages the commenter to participate in the regional process to develop those requirements and help identify the RRO's exemption criteria.			
Raj Rana – AEP	Yes	Yes	See AEP Comment
Response: See AEP response.			
Joseph F. Buch – Madison Gas and Electric	Yes		This new standard requires the region to define temporary excursions and the requirement that generators stay connected during these temporary excursions. The excursions have not been defined nor has any provision been made for exceptions. As a generator owner we cannot recommend approval of a standard for which we do not know what will be required or what testing we are going to have to perform. The entire area of risk of machine damage versus different temporary system excursions and costs of testing needs careful investigation. It is recommended that this standard begin with a pilot of selected units followed by field testing to better define the requirements.
Response: The ride-through requirements and criteria for exemptions are to be defined in the regional procedure. This standard includes only the development of a regional procedure. There are many items to be considered in developing the RRO's requirements and exemption criteria and the drafting team encourages the commenter to participate in the regional process to develop those requirements and help identify the RRO's exemption criteria. This standard does not address implementation by the generators.			
Southern Company	No	No	This standard should be addressed separately from Phase III/IV and included in a separate

Commenters	Reliability Need?	Acceptable Translation?	Comments
Generation			SAR. SoCo Generation does not support this standard being in Phase III/IV because there is no engineering basis for establishing the temporary voltage and frequency excursions for which turbine-generator and auxiliary equipment can safely continue to perform its intended functions.
Response: The drafting team, as supported by industry comments, believes that generator ride-through capability is necessary for reliable bulk electric system operation. What has not been determined on a uniform basis is what those capabilities should be. That is the purpose of requiring RROs to develop regional requirements to address the specific requirements. The commenter is encouraged to work within the regional process to develop those requirements.			
Brandon Snyder – Duke Energy	Yes	No	There is no generally accepted method for analyzing thes events. SAR should be considered when more research is done.
Response: The commenter is encouraged to submit a SAR to further develop standards in this area. The drafting team intends that the existing draft standard will require RROs to develop ride through requirements and envisions that these will be practical with today's technology and analysis methods.			
Kansas City Power and Light	Yes	No	Transmission Owners are required to maintain the interconnection as described in TOP-004-0 R5
Response: TOP-004-0 R5 addresses keeping the transmission system interconnected and does not address generator ride-through.			
Mark Kuras – MAAC	Yes	No	For existing units, this standard, in fact, deals with generator protection or how the generator is protected. In other words, when will a generator trip during excursions of frequency or voltage. For new units, the establishment of regional requirements will help generation developers purchase equipment to conform. Frequency issues: Exemption criteria - There must be coordination with UFLS in all instances where generation could trip prior to last stage of UFLS. What is the difference between an exemption in R2 and a variance in R3? New R2.4 For each unit exempted, frequency trip points and times must be specified so that underfrequency load shedding programs can be augmented.
Response: The drafting team agrees that ride-through requirements translate to generator protection. The drafting team has added requirement 2.1 to address coordination with UFLS set points. Exemption, which means the requirement is not applicable, is different than a variance, which could include a different approach or requirement.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
A clarification has been added to further explain the intent of variance in R4. The drafting team agrees that standards should encourage vendors to develop compliant equipment.			
Multi-Regional Modeling Working Group	Yes	No	For existing units, this standard, in fact, deals with generator protection or how the generator is protected. In other words, when will a generator trip during excursions of frequency or voltage. For new units, the establishment of regional requirements will help generation developers purchase equipment to conform. Frequency issues: Exemption criteria - There must be coordination with UFLS in all instances where generation could trip prior to last stage of UFLS. What is the difference between an exemption in R2 and a variance in R3?
Response: The drafting team agrees that ride-through requirements translate to generator protection. The drafting team has added requirement 2.1 to address coordination with UFLS set points. Exemption, which means the requirement is not applicable, is different than a variance, which could include a different approach or requirement. A clarification has been added to further explain the intent of variance in R4. The drafting team agrees that standards should encourage vendors to develop compliant equipment.			
Gred Mason – Dynergy Generation	Yes	No	1. Generation Owners and Transmission Owners should be added to Section 4, Applicability 2. SectionB,R1 should be modified to read as follows:"…The Regional Reliability Organization shall, in coordination with Generation Owners and Transmission Owners, establish…"Regions should be required to involve Generation Owners and Transmission Owners when establishing the required procedures.
Response: The drafting team has added generator owners and transmission owners to the applicability section and added R7 which requires the Generator Owners and Transmission Owners to comply with the RRO's requirements. The expectation is that the Region will involve Generation Owners and Transmission Owners through regional membership representation and adding this into the requirements doesn't seem needed.			
SPP Transmission Working Group	Yes	No	Temporary Excursion needs to be defined and put into glossary. R2 – Sentence should be ended after R1, delete the words BASED ON. Delete R2.1, R2.2, and R2.3
Response: The revised standard doesn't use the term, 'temporary excursion'.			

Commenters	Reliability Need?	Acceptable Translation?	Comments
R2 was modified as requested.			
FRCC	Yes	No	Remove sub requirements R2.1, R2.2 and R2.3 and delete - based on: - from the end of R2. The RRO should develop the appropriate criteria based on the specifics within the RRO.
Response: R2 was modified as requested.			
NERC Interconnection Dynamics Working Group	Yes	No	Reliability Need – The IDWG agrees with the need for this standard which provides a valuable NERC mandate for the development of Region specific generator protection coordination requirements for disturbances that result in temporary excursions in grid frequency and voltage from their normal range. — It is recommended that sub requirements R2.1, R2.2, and R2.3 be removed. It is sufficient for the Region to follow R2 to develop exemption criteria as appropriate for the Region, provided that the regional exemption criteria do not adversely impact bulk electric system performance. — R1.2 – Reword to read: The definition of temporary excursions expressed as a function of each of the following: … — R1 – It should be clear that generators, as a minimum, do not trip (ride-through capability) for normally cleared transmission system faults that do not isolate the unit.
Response: R2 was modified as requested. The drafting team does not believe adding 'each of the following' adds any clarity to what is already written. The standard was revised to require the RRO to establish a requirement for coordination of generator protection, including back-up protection, with transmission Protection Systems. This supports the intent of your suggestion.			
Peter Burke – American Transmission Co.	Yes	No	Change proposed effective date and timeline from October 1 to November 1. R1. Change "interconnected" to "connected". R2. Change "exemptions" to "exemptions or variances" and delete R3 as it becomes redundant. This standard specifies requirements, criteria and procedures to be established by the RRO. Is there a standard applicable to GO's and GOp's with complementary requirements and measures? Without such a complementary standard, there is rather limited reliability benefit

Commenters	Reliability Need?	Acceptable Translation?	Comments
			from implementing VAR-004. Why is this a VAR standard? Content is more closely related to relays and controls. Suggest re-classifying it as a PRC standard.
Response: Date has been corrected and is subject to further revision in accordance with a new timetable for approval. 'Interconnected' has been revised to 'connected'. The drafting team has clarified the distinction between an exemption, which means the criteria are not applicable, and a variance, which means different criteria may be applicable. The drafting team added R7 to require generator owners and transmission owners to meet the regional requirements. and will highlight this change to see if it meets stakeholder acceptance. The drafting team agrees this should be a PRC standard and the second draft is numbered as PRC-024.			
Individual Members of CCMC	Yes	No	It may be more appropriate to include exemptions to a standard in the regional differences section of the standard. Otherwise there are no exemptions allowed. Therefore R 2, R3, and R5 (exemption and variance terms) should be eliminated.
Response: The exemptions referred to in the standard are not exemptions to the NERC standard, which requires the region to develop criteria. The exemptions are to the regional criteria. The drafting team has distinguished the intended meaning of exemptions (exceptions to meeting the criteria) and variances (use of alternative criteria).			
Joseph D Willson– PJM	Yes	No	Levels need to be changed to reflect elimination of exemptions and variances. Exemptions to a standard must be included in the regional differences section of the standard. Otherwise there are no exemptions allowed. Therefore R 2, R3, and R5 (exemption and variance terms) should be eliminated
Response: The exemptions referred to in the standard are not exemptions to the NERC standard, which requires the region to develop criteria. The exemptions are to the regional criteria. The drafting team has distinguished the intended meaning of exemptions (exceptions to meeting the criteria) and variances (use of alternative criteria).			
John Horakh – MACC	Yes	Yes	This is not really a VAR standard, it covers frequency, as well as voltage, excursions. Could be a TOP or PRC standard.

VAR-004-1 (Re-numbered as PRC-024) Generator Performance during Temporary Frequency and Voltage Excursions

Commenters	Reliability Need?	Acceptable Translation?	Comments
Response: The drafting team agrees and will renumber the standard to be a PRC standard and the second draft is numbered as PRC-024. .			
Consolidated Edison Cinod Kotecha IESO – Ontario Kathleen Goodman – ISO-NE Alan Adamson – NYSRC NPCC CP9 RSWG	Yes Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes Yes	Typo in "Proposed Effective Date" November.
Response: Date was corrected and is subject to further change as the drafting team considers a new approval schedule.			
Xcel Energy – Northern States Power	Yes	Yes	Change the effective date to coincide with the expected November 1, 2005 approval by the BOT.
Response: Date was corrected and is subject to further change as the drafting team considers a new approval schedule.			
Southern Company – Transmission	Yes	Yes	In order to properly design schemes whose function is to save the transmission system against credible multiple contingency events, TPs and PAs must understand to what extent units can stay on-line for transmission system frequency and voltage excursions. Examples of these resque schemes include underfrequency and undervoltage load shedding schemes. Therefore, adoption of this standard would help ensure that critical assumptions used to develop transmission rescue schemes are valid.
Response: The drafting team agrees. The draft standard does not currently require generator protection and controls to be defined in system models. If generator and transmission protection are effectively coordinated, it can be assumed in models that the system (transmission and generation) will perform as desired.			
Michael C. Calimano – NYISO	Yes	Yes	NYISO recommends defining "variance" and "exemption" as used within the standards. The proper location for the definitions is within the Glossary of Terms. This will eliminate

Commenters	Reliability Need?	Acceptable Translation?	Comments
			ambiguous interpretations of what is meant by variances or exemptions.
Response: The drafting team has distinguished the intended meaning of exemptions (exceptions to meeting the criteria) and variances (use of alternative criteria).			
Gerald Rheault – Manitoba Hydro	Yes	Yes	R1: should be minimum requirements. Different regions may have more stringent requirements. R2: There should be no general exemptions - all generators should be to operate during temp. excursions. This standard seems out of place in the VAR category
Response: The drafting team has added R2.1 and R2.2 to ensure the RRO's requirements address coordination of protection – these are needed for reliability. Remaining requirements have been delegated to the RRO for definition. The drafting team disagrees regarding the need for exemptions. For example, very small units may have little or no impact on bulk electric system reliability. The drafting team is renumbering this standard to be a PRC standard and the second draft is numbered as PRC-024.			
Midwest Reliability Organization	Yes	Yes	Change proposed effective date and timeline from October 1 to November 1. R1. Change "interconnected" to "connected". R2. Change "exemptions" to "exemptions or variances" and delete R3 as it becomes redundant. This standard seems out of place in the VAR category
Response: The drafting team has corrected the date, which is subject to further revision as the drafting team considers a new approval schedule. Interconnected has been changed to connected. The drafting team has distinguished the intended meaning of exemptions (exceptions to meeting the criteria) and variances (use of alternative criteria). The drafting team is renumbering this standard to be a PRC standard and the second draft is numbered as PRC-024.			
Transmission Subcommittee			VAR-004-1, R2: TS recommends considering combining R2 and R3. This can be accomplished by the addition of "variances" to R2 and deleting R3. VAR-004-1, R2 and R3: TS recommends defining "variance" and "exemption" as used within the standards. The proper location for the definitions is within the Glossary of Terms.

Commenters	Reliability Need?	Acceptable Translation?	Comments
			This will eliminate ambiguous interpretations of what is meant by variances or exemptions. The TS does not offer a recommended definition for either term.
Response: The drafting team has distinguished the intended meaning of exemptions (exceptions to meeting the criteria) and variances (use of alternative criteria).			
SERC EC Planning Standards Subcommittee (PSS) Tennessee Valley Authority Entergy John K. Loftis, Jr. – Dominion – Electric Transmission	Yes Yes Yes Yes	Yes Yes Yes Yes	R5 – replace excursions in voltage, frequency, and real and reactive power output of a generator with excursions in voltage and frequency.
Response: the subject phrase is not used in the revised standard.			
Ed Riley – California ISO	Yes	Yes	
ISO/RTO Council Standards Review Committee	Yes	Yes	
Doug Hohbough – First Energy Corp.	Yes	Yes	
WECC Reliability Subcommittee	Yes	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	Yes	
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	Yes	
Kenneth Dresner – FirstEnergy Solutions	Yes	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	Yes	
PPL Corporation	Yes	Yes	
Resource Issues Subcommittee	Yes	Yes	
Samuel W. Leach – TXU Power	Yes	Yes	
Karl Kohlrus - City Water, Light &	Yes	Yes	

Commenters	Reliability Need?	Acceptable Translation?	Comments
Power			
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	Yes	
Howard Rulf - WE Energies	Yes	yes	
Mohan Kondragunta – Southern California Edison	Yes	Yes	

Comments on Field Testing and Effective Dates

Summary Consideration: Most commenters did not indicate a need for field testing so the drafting team is not recommending it be field tested.

Commenters	Field Test Required?	Recommended Date?	Justification
Raj Rana – AEP	Yes	11/01/05	The subject is complex. Prepare a white paper to facilitate field testing. White paper and field testing experience may lead to drafting a new SAR.
Response: Most commenters did not indicate a need for field testing so the drafting team is not recommending it be field tested. Please be more specific in letting us know what you think needs to be field tested.			
Joseph F. Buch – Madison Gas and Electric	Yes		This entire area of generator performance during temporary voltage and frequency excursions needs careful and detailed analysis so that requirements are not established which risk damaging machines. It is recommended that a pilot of several units be undertaken before beginning field testing. In addition we question if the costs of testing small units outweighs the benefits.
Response: The RRO may exempt some units from having to comply with any or all of the requirements in this standard. Note that the drafting team made significant changes to this standard. Please review the revised standard and let us know if you still think field testing is needed.			
Tennessee Valley Authority	Yes		This will create tremendous overhead on personnel, analysis, and documentation. The standard will be complicated and we need to judge the benefits of the complexities.
Response: Note that the drafting team made significant changes to this standard. Please review the revised standard and let us know if you still think field testing is needed.			

Deletion of I.D.M2 Coordinate and Optimize the Use of Generator Reactive Capability

Commenters	Agree with Deleting?	Comments

I.D.M2 Coordinate and Optimize the Use of Generator Reactive Capability

Ronnie Frizzell - Arkansas Electric Coop. Corp.	Abstains	I am not convinced that this standard should be dropped. My concern is that coordinated planning continues between generation and transmission. I disagree with the first reason for the deletion of the standard. Generators have no obligation to meet TPL - 01--04. The burden is on the TP and PA, if a generator is not willing to cooperate and provide data then holes will form.
Response: The drafting team believes the requirements are covered under existing V0 standards, MOD-010-0 through MOD-013-0.		
John Horakh – MACC	Yes	Very difficult to tell when capability has been optimized
Response: The drafting team agrees.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	

Deletion of I.D.M2 Coordinate and Optimize the Use of Generator Reactive Capability

Commenters	Agree with Deleting?	Comments
Michael C. Calimano – NYISO	Yes	
Jerry Nicely – TVA Nuclear Generation	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Peter Burke – American Transmission Co.	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	

Deletion of I.D.M2 Coordinate and Optimize the Use of Generator Reactive Capability

Commenters	Agree with Deleting?	Comments
Samuel W. Leach – TXU Power	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	
NPCC CP9 RSWG	Yes	
SERC EC Generation Subcommittee (GS)	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

Commenters	Agree with Deleting?	Comments

II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

John Harris - Load Forecasting Working Group	No	Reliability results from having adequate resources (generation and transmission) to serve anticipated load. Future anticipated load is, by definition, uncertain because of key uncertainties of the forecast. Forecast uncertainty automatically translates into uncertainty of the generation and transmission resources being adequate. Assuring consistency between actual and forecast demand is one way to judge if the forecast is reasonable. While the actual and forecast demand (including DSM) is addressed in standard MOD-016, the statement that the consistency of actual and forecast demand does not impact overall reliability of the interconnected electric transmission grid is inconsistent with the working definition of overall reliability.
Response: The drafting team believes the standard deleted was to provide consistency between reporting to NERC and Gov't agencies; Forecast vs actual loads is covered elsewhere in MOD-016-0.		
Robert W. Cummings - NERC	No	This concept should not be deleted, but included in other standards (MOD-16 through 21). Data coordination has been done with EIA by the Regions through the NERC Data Coordination Working Group (DCWG) of the RAS since 1992. The data reported to EIA and NERC NEED to be the same...it is not just a nicety. These are inter-dependent data reporting streams, not independent. They use data we provide and we use data reported to them. Further, if the two diverge, then, of necessity, we will need to duplicate all the data reporting that goes on to EIA for RAS. Consistent data reporting from Region to Region and to EIA is NECESSARY for the NERC RAS to do their job for Reliability. If EIA's data is different or reported in a haphazard fashion, we all (all regions) get to explain to EIA, DOE, FERC, and the rest of the world. WHY they are different. I'd really hate to have the DCWG have to go back to the duplicative reporting and constant questions of 1990. — Maybe the best long-run solution is to modify MOD 16 through 21 to include the consistency in reporting to related government entities.

Deletion of II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

Commenters	Agree with Deleting?	Comments
Response: The drafting team believes NERC should avoid tying reliability standards performance to third party entity requirements, and removing this standard fits that viewpoint. The requirement for consistency in NERC reporting is covered in MOD-016-0.		
Data Coordination Working Group	Yes	DCWG agrees with deleting II.D.M3 in its current structure and the drafting team's rationale for the deletion but is concerned about possible duplication of effort if NERC and government agencies do not coordinate data collection. NERC should avoid tying reliability standards performance to third party entity requirements, and removing this standard fits that viewpoint. NERC does not always agree with others regarding what data are necessary for reliability. A good example is the difficulty faced by NERC and the Regions in trying to incorporate Energy Information Agency (EIA) form changes into NERC's 2005 data collection process. The downside of not having a consistency requirement includes possible duplicate reporting, multiple definitions and/or standards for similar data points, and the burden of explaining to outside entities why and how the data are different. We received two suggestions for possible retention of consistency wording in the standards. One suggestion was to build a consistency requirement into the MOD-016 -MOD-021 standards. The other suggestion was to replace this standard with a requirement that the RRO's data must be presented to NERC on an annual timetable established by NERC, in the format established by NERC, and following the data definitions established by NERC and have NERC work with the various government agencies to retain coordination and consistency.
Response: The drafting team agrees with the DCWG comments, although we also believe the JIC should consider whether this may appropriately belong as a business practice because the consistency of reporting of data between agencies is not a reliability issue.		
SPP Transmission Working Group	Yes	Ought to go to NAESB
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	I agree that this may not be necessary as a reliability, however the companies data should be reported consistently. Maybe this is one for NAESB.
Response: The drafting teams believes the JIC should consider whether this may appropriately belong as a business practice because the		

Deletion of II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

Commenters	Agree with Deleting?	Comments
consistency of reporting of data between agencies is not a reliability issue.		
John Horakh – MACC	Yes	Maybe this should be a NAESB Business Standard
Response: The drafting teams believes the JIC should consider whether this may appropriately belong as a business practice because the consistency of reporting of data between agencies is not a reliability issue.		
Peter Burke – American Transmission Co.	Yes	Suggest revisiting the need for this standard when distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged in the development of appropriate standards.
Response: The DT believes it is unnecessary to revisit this issue because it believes this is not a reliability issue. The drafting team believes the JIC should consider whether this may appropriately belong as a business practice because the consistency of reporting of data between agencies is not a reliability issue.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	

Deletion of II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

Commenters	Agree with Deleting?	Comments
Kathleen Goodman – ISO-NE	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	

Deletion of II.D.M3 Consistency of Actual and Forecast Demands and Controllable DSM Data Reported for Reliability & to Gov't Agencies

Commenters	Agree with Deleting?	Comments
Karl Kohlrus - City Water, Light & Power	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses

Commenters	Agree with Deleting?	Comments
II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses		
Gerald Rheault – Manitoba Hydro	Yes	Good planning practices should assess sensitivity to customer dynamic demand characteristics. Worst case assumptions can be applied where it is critical. Demand forecasts are best guesses. The only certainty is that they are wrong.
Response: Thank you for your comment.		
Transmission Agency of Northern California	Yes	We agree that it is appropriate to drop this standard at this time. However, we would like to emphasize that lack of a NERC Standard in this area does not prohibit entities from submitting dynamic characteristics for their loads to their Region if they so desire.
Response: Thank you for your comment.		
John Horakh – MACC	Yes	Dynamic demand characteristics are, of course, modeled in dynamic simulations. As per proposed standard MOD-022 (Use of Disturbance Data to Develop and Maintain Models), dynamic demand characteristics c an sometimes be refined by adjusting them to achieve simulation results that match actual disturbance data.
Response: Thank you for your comment.		
Raj Rana – AEP	Yes	Power flow and dynamics planning base cases are intended for a wide variety of study applications having different load modeling requirements. In most planning studies, load MW and MVAR response to voltage and frequency variability is a relatively insignificant matter and the standard constant P/Q or ZIP approximations are satisfactory. This includes almost all power flow analysis and transient stability studies. However there is wide recognition that the study of certain phenomena requires specialized load modeling. These phenomena are voltage collapse and instability, and unstable or poorly damped power swings, and also to some degree large frequency disturbances.

Deletion of II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses

Commenters	Agree with Deleting?	Comments
		Unfortunately, research on load modeling suitable for use covering these phenomena has not yet resulted in any industry-wide determination of best practices. However, in the mean time, experienced planning engineers can usually devise suitable load modeling appropriate to these areas of study. Deletion of II.E.M1-M3 standards and reliance on experienced planners is the best course at the present time.
Response: Thank you for your comment.		
Peter Burke – American Transmission Co.	Yes	Include reference to the existing dynamic data requirements in MOD-012-0. Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged the development of appropriate standards.
Response: Thank you for your comment. MOD-012-0 adequately addresses your request.		
NERC Interconnection Dynamics Working Group	Yes	Future standards for dynamic load modeling and dynamic demand characteristics are important. However, an attempt to establish standards at this time without registered distribution Providers is premature.
Response: Thank you for your comment.		
Transmission Issues Subcommittee	Yes	There may be an inconsistency between dropping this standard and the requirement of MOD-022-1 to use recorded data to develop and enhance steady state and dynamics models. That requirement appears to assume that there are adequate dynamic demand models. This discrepancy should be recognized in requirements of MOD-022-1 and future standards should address this discrepancy.
Response: Thank you for your comment. The drafting team believes the standard for deletion addresses only a portion of the dynamic model picture, whereas MOD-022-0 covers a wider area dealing with system dynamics which has a greater impact on reliability which encompasses		

Deletion of II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses

Commenters	Agree with Deleting?	Comments
this deleted standard.		
Deborah M. Linke – US Bureau of Reclamation	Yes	
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	

Deletion of II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses

Commenters	Agree with Deleting?	Comments
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	

Deletion of II.E.M1 Customer (dynamic) Demand Characteristics to be Determined and Reported for Reliability Analyses

Commenters	Agree with Deleting?	Comments
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of II.E.M2 Requirements for Determining Customer (dynamic) Demand Characteristics to be Included in Procedural Manuals

Commenters	Agree with Deleting?	Comments
II.E.M2 Requirements for Determining Customer (dynamic) Demand Characteristics to be Included in Procedural Manuals		
Transmission Agency of Northern California	Yes	We agree that it is appropriate to drop this standard at this time.
Response: Thank you for your comment.		
Peter Burke – American Transmission Co.	Yes	Include reference to the existing dynamic data requirement procedure in MOD-013-0. Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged the development of appropriate standards.
Response: The drafting team believes MOD-013-0 adequately addresses your request.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	

Deletion of II.E.M2 Requirements for Determining Customer (dynamic) Demand Characteristics to be Included in Procedural Manuals

Commenters	Agree with Deleting?	Comments
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	

Deletion of II.E.M2 Requirements for Determining Customer (dynamic) Demand Characteristics to be Included in Procedural Manuals

Commenters	Agree with Deleting?	Comments
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	
NERC Interconnection Dynamics Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of II.E.M3 Load-Serving Entities to Provide Customer (dynamic) Demand Characteristics

Commenters	Agree with Deleting?	Comments
II.E.M3 Load-Serving Entities to Provide Customer (dynamic) Demand Characteristics		
Transmission Agency of Northern California	Yes	We agree that it is appropriate to drop this standard at this time. However, we would like to emphasize that lack of a NERC Standard in this area does not prohibit entities from submitting dynamic characteristics for their loads to their Region if they so desire.
Response: Thank you for your comment.		
Peter Burke – American Transmission Co.	Yes	Include reference to the existing dynamic data requirement procedure in MOD-013-0. Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged the development of appropriate standards.
Response: The drafting team believes MOD-013-0 adequately addresses your request.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	

Deletion of II.E.M3 Load-Serving Entities to Provide Customer (dynamic) Demand Characteristics

Commenters	Agree with Deleting?	Comments
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	

Deletion of II.E.M3 Load-Serving Entities to Provide Customer (dynamic) Demand Characteristics

Commenters	Agree with Deleting?	Comments
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Joseph F. Buch – Madison Gas and Electric	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	
NERC Interconnection Dynamics Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of III.B.M1 Assessment of Transmission Control Devices

Commenters	Agree with Deleting?	Comments

III.B.M1 Assessment of Transmission Control Devices

Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Dan Griffiths – PA Office of Consumer Advocate	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
Gerald Rheault – Manitoba Hydro	Yes	

Deletion of III.B.M1 Assessment of Transmission Control Devices

Commenters	Agree with Deleting?	Comments
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Peter Burke – American Transmission Co.	Yes	
Joseph D Willson– PJM	Yes	
Multi-Regional Modeling Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	

Deletion of III.B.M1 Assessment of Transmission Control Devices

Commenters	Agree with Deleting?	Comments
Tennessee Valley Authority	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Deletion of IV.B.M1 Documentation of Regional Load Restoration Policies and Programs

Commenters	Agree with Deleting?	Comments

IV.B.M1 Documentation of Regional Load Restoration Policies and Programs

NERC Interconnection Dynamics Working Group	Yes	Future standards for coordinating distribution automation and automatic load shedding with transmission system safety nets are important. However, an attempt to establish standards at this time without registered Distribution Providers is premature.
Response: Thank you for your comment, the DT concurs.		
John Horakh – MACC	Yes	A NERC Guide on ALR might be appropriate.
Response: The drafting team recommends you forward this request to the appropriate NERC group.		
Peter Burke – American Transmission Co.	Yes	Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged in the development of appropriate standards.
Response: Thank you for your comment.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	

Deletion of IV.B.M1 Documentation of Regional Load Restoration Policies and Programs

Commenters	Agree with Deleting?	Comments
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers	Yes	

Deletion of IV.B.M1 Documentation of Regional Load Restoration Policies and Programs

Commenters	Agree with Deleting?	Comments
Jay Sietz – US Bureau of Reclamation Brenda Anderson		
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph D Willson– PJM	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	
Transmission Issues Subcommittee	Yes	

Deletion of IV.B.M2 Documentation of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments

IV.B.M2 Documentation of Automatic Load Restoration Programs

Peter Burke – American Transmission Co.	Yes	Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged in the development of appropriate standards.
Response: Thank you for your comment.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	

Deletion of IV.B.M2 Documentation of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	

Deletion of IV.B.M2 Documentation of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph D Willson– PJM	Yes	
NERC Interconnection Dynamics Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	
Transmission Issues Subcommittee	Yes	

Deletion of IV.B.M3 Assessment of the Effectiveness of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments
IV.B.M3 Assessment of the Effectiveness of Automatic Load Restoration Programs		
Peter Burke – American Transmission Co.	Yes	Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged in the development of appropriate standards.
Response: Thank you for your comment.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Gerry Burrows Harold Wyble Jim Useldinger	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	

Deletion of IV.B.M3 Assessment of the Effectiveness of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	

Deletion of IV.B.M3 Assessment of the Effectiveness of Automatic Load Restoration Programs

Commenters	Agree with Deleting?	Comments
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph D Willson– PJM	Yes	
NERC Interconnection Dynamics Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	
Transmission Issues Subcommittee	Yes	

Deletion of IV.B.M4 Automatic Load Restoration Equipment Maintenance Requirements

Commenters	Agree with Deleting?	Comments

IV.B.M4 Automatic Load Restoration Equipment Maintenance Requirements

Peter Burke – American Transmission Co.	Yes	Suggest revisiting the need for this standard when Distribution Providers and Load-serving Entities are registered under the functional model and are more fully engaged in the development of appropriate standards.
Response: Thank you for your comment.		
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
FRCC	Yes	
Cinod Kotecha	Yes	
IESO – Ontario	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Mark Kuras – MAAC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	

Deletion of IV.B.M4 Automatic Load Restoration Equipment Maintenance Requirements

Commenters	Agree with Deleting?	Comments
Michael C. Calimano – NYISO	Yes	
WECC Reliability Subcommittee	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	

Deletion of IV.B.M4 Automatic Load Restoration Equipment Maintenance Requirements

Commenters	Agree with Deleting?	Comments
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Joseph D Willson– PJM	Yes	
NERC Interconnection Dynamics Working Group	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	
Transmission Issues Subcommittee	Yes	

Definition of Cranking Path

Commenters	Agree with Definition?	Comments

Definition of Cranking Path:

Cranking Path — A portion of the electric system that can be isolated and then energized to deliver electric power from a generation source to enable the startup of one or more other generating units.

Summary Consideration: Most commenters agreed with the definition, so it wasn't changed.

Joseph D Willson– PJM	No	This is not a portion of a system but a transmission facility that is used during system restoration to provide off-site power (cranking power) to a generator not able to self-start.
Response: The drafting team notes that a transmission facility is a portion of the electric system.		
Mohan Kondragunta – Southern California Edison	No	SCE recommends that the term be renamed to "System Restoration Cirtical Path."
Response: Most commenters agreed with the definition so it wasn't changed.		
Xcel Energy – Northern States Power	No	This can be interpreted that a cranking path can be from a non-blackstart facility to some other facility. This does not serve the purpose. The definition should read "an isolated portion of an electric system that when energized from restoration plan designated rewources, can be used to supply start-up energy to major grid dependent generation plants."
Response: The drafting team believes that the term (gen source) encompasses both blackstart and non-blackstart facilities necessary to support system restoration, therefore it believes that no change is necessary.		
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	Possibly use "Free-Way"
Response: Most commenters agreed with the definition so it wasn't changed.		
Dan Griffiths – PA Office of Consumer Advocate	Yes	One question occurs: if a Black Start unit is needed to start a second unit which is in turn needed to start a third, much larger unit, what is the cranking

Definition of Cranking Path

Commenters	Agree with Definition?	Comments
		path?
Response: The cranking path encompasses all the facilities necessary to support the startup of a specific unit.		
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Consolidated Edison	Yes	
Kathleen Goodman – ISO-NE	Yes	
Gred Mason – Dynergy Generation	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Ed Riley – California ISO	Yes	
Southern Company Generation	Yes	
ISO/RTO Council Standards Review Committee	Yes	

Definition of Cranking Path

Commenters	Agree with Definition?	Comments
Transmission Agency of Northern California	Yes	
Southern Company – Transmission	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Peter Burke – American Transmission Co.	Yes	
Samuel W. Leach – TXU Power	Yes	
NPCC CP9 RSWG	Yes	
PPL Corporation	Yes	

Definition of Cranking Path

Commenters	Agree with Definition?	Comments
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Transmission Issues Subcommittee	Yes	

Definition of Disturbance Monitoring Equipment

Commenters	Agree with Definition?	Comments

Definition of Disturbance Monitoring Equipment:

(Original) **Disturbance Monitoring Equipment —** Device(s) capable of detecting and recording System electrical data during Monitoring a Disturbance. Examples include sequence of event recorders, fault Equipment recorders, and dynamic disturbance recorders.

(Modified) **Disturbance Monitoring Equipment (DME):** Devices capable of recording system data pertaining to a Disturbance. Such equipment includes the following categories of recorders:

- Sequence of event recorders, which record equipment response to the event
- Fault recorders, which record actual waveform data replicating the system primary voltages and currents. This may include protective relays.
- Dynamic Disturbance recorders, which continuously record incidents that portray power system behavior during dynamic events such as low-frequency (0.1 Hz – 3 Hz) oscillations and abnormal frequency or voltage excursions

Summary Consideration: The drafting team modified the definition as shown above. These modifications provide a more detailed definition as suggested in the comments below, and provide better alignment with the modifications to the two standards that use this term, PRC-002 and PRC-018.

Commenters	Agree with Definition?	Comments
IESO – Ontario ISO/RTO Council Standards Review Committee Ed Riley – California ISO Michael C. Calimano – NYISO	Yes and No Yes and No Yes Yes	We offer the following modification to the first sentence: Device(s) capable of detecting a Disturbance and recording System electrical data prior to and during the Disturbance.
Response: While the drafting team didn't use the exact words suggested, the modifications made to the definition support the intent of your suggestion.		
Transmission Issues Subcommittee	No	Modify as follows: "electrical data immediately preceeding and during a Disturbance."
Response: The drafting team used the phrase, 'pertaining to a Disturbance' rather than 'immediately preceding and during'. This modification allows a broader use of the term, DME than the modification proposed.		

Definition of Disturbance Monitoring Equipment

Commenters	Agree with Definition?	Comments
Gerald Rheault – Manitoba Hydro	No	It should be understood in this definition that a disturbance includes pre-fault and post-fault period monitoring
Response: Agreed. The drafting team modified the definition to state this more clearly.		
Joseph D Willson– PJM	No	A definition should be inclusive. By stating examples you have diluted the meaning.
Response: The modified definition is more specific by clearly indicating that there are three types of equipment included in the category called DME. This modification makes the definition align more clearly with the revisions made to PRC-002 and PRC-018. We encourage you to look at the use of the term in the revised standards and let us know if you agree with the proposed changes to the definition.		
NERC Interconnection Dynamics Working Group	No	See MOD-022-1
Response: See response to comments on MOD-022-1.		
NERC System Protection and Controls Task Force	No	Add microprocessor relays to the list.
Response: While 'microprocessor relays' weren't specifically added, the definition was modified to indicate that protective relays can serve as a type of fault recorder.		
Southern Company Generation	No	Need to permit relays with oscillography capability
Response: While 'relays with oscillograph capability' weren't specifically added, the definition was modified to indicate that protective relays can serve as a type of fault recorder.		
Greg Ludwicki – Northern Indiana Public Service Co.	Yes	Would like to have specifics of type of recorder
Response: The definition was modified to indicate that there are three types of equipment in the category of equipment called DME. The three types are sequence of event recorders, fault recorders and dynamic disturbance recorders. These changes align with the changes made to the two standards that use the term, DME.		

Definition of Disturbance Monitoring Equipment

Commenters	Agree with Definition?	Comments
NPCC CP9 RSWG Cinod Kotecha Kathleen Goodman – ISO-NE	Yes Yes Yes	Capture prefault information
Response: The definition was revised to indicate that some recorders capture data on a continuous basis, which includes prefault.		
Mark Kuras – MAAC	Yes	Add the words …a disturbance… after…detecting… Also add the words …before and… after …data…
Response: The definition was revised to support the intent of this suggestion.		
SPP Transmission Working Group	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Howard Rulf - WE Energies	Yes	
WECC Disturbance Monitoring Work Group	Yes	
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	
Consolidated Edison	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	

Definition of Disturbance Monitoring Equipment

Commenters	Agree with Definition?	Comments
Transmission Agency of Northern California	Yes	
Doug Hohbough – First Energy Corp.	Yes	
Carol L. Krysevig – Allegheny Energy Supply Co.	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers Jay Sietz – US Bureau of Reclamation Brenda Anderson	Yes	
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Raj Rana – AEP	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Peter Burke – American Transmission Co.	Yes	
Samuel W. Leach – TXU Power	Yes	
PPL Corporation	Yes	
SERC EC Planning Standards Subcommittee	Yes	

Definition of Disturbance Monitoring Equipment

Commenters	Agree with Definition?	Comments
(PSS)		
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	

Definition of Power Electronic Control Device

Commenters	Agree with Definition?	Comments

Definition of Power Electronic Control Device:

Power Electronic Control Device — A device using semiconductor technology to provide dynamic control of Control Device one or more electric power system quantities. Examples include high voltage direct current links, static Var compensators, thyristor-controlled series capacitors, and unified power flow controllers.

Summary Consideration: This definition was only used in MOD-028, and the drafting team is recommending that MOD-028 be dropped from further development as a standard in the set of Phase III & IV Standards. MOD-028 is redundant with MOD-012 and MOD-013.

Mark Kuras – MAAC	No	We are recommending deletion of MOD-028 as we see no need to deal with these devices specially. That is the only place this term is used; therefore we see no need for this definition.
Greg Ludwicki – Northern Indiana Public Service Co.	No	Still is not clear. Does this or does it not include breakers? They should specifically "say that it does not include breakers."
Joseph D Willson– PJM	No	A definition should be inclusive. By stating examples you have diluted the meaning.
Multi-Regional Modeling Working Group	No	We are recommending deletion of MOD-028 as we see no need to deal with these devices specially. That is the only place this term is used; therefore we see no need for this definition.
ISO/RTO Council Standards Review Committee IESO – Ontario Ed Riley – California ISO	Yes and No Yes Yes	In the event MOD-028 is not passed, then this definition should be dropped.
Raj Rana – AEP	Yes	Unfortunately, this definition excludes the GE variable frequency transformer (VFT) device.
Gred Mason – Dynergy Generation	Yes	
Mohan Kondragunta – Southern California Edison	Yes	

Definition of Power Electronic Control Device

Commenters	Agree with Definition?	Comments
Consolidated Edison	Yes	
Cinod Kotecha	Yes	
Kansas City Power and Light	Yes	
Alan Adamson – NYSRC	Yes	
Kathleen Goodman – ISO-NE	Yes	
SPP Transmission Working Group	Yes	
Howard Rulf - WE Energies	Yes	
Michael C. Calimano – NYISO	Yes	
Gerald Rheault – Manitoba Hydro	Yes	
John K. Loftis, Jr. – Dominion – Electric Transmission	Yes	
Midwest Reliability Organization	Yes	
Southern Company Generation	Yes	
Transmission Agency of Northern California	Yes	
Southern Company – Transmission	Yes	
Rebecca Berdahll – Bonneville Power Administration Karl Bryan – Corp of Engineers	Yes	

Definition of Power Electronic Control Device

Commenters	Agree with Definition?	Comments
Jay Sietz – US Bureau of Reclamation Brenda Anderson		
Entergy	Yes	
Karl Kohlrus - City Water, Light & Power	Yes	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	Yes	
John Horakh – MACC	Yes	
Deborah M. Linke – US Bureau of Reclamation	Yes	
Peter Burke – American Transmission Co.	Yes	
Samuel W. Leach – TXU Power	Yes	
NPCC CP9 RSWG	Yes	
SERC EC Planning Standards Subcommittee (PSS)	Yes	
Tennessee Valley Authority	Yes	
Xcel Energy – Northern States Power	Yes	
Transmission Issues Subcommittee	Yes	

Other Comments on the Standards

Commenters	Comment

General Comments on Field Testing and Effective Dates

Note that there are some standards that did not receive any suggestions for field testing or modifications to the effective dates. The standards in Set One that did not receive any comments include: PRC-003, PRC-004 and PRC-005.

Consolidated Edison Alan Adamson – NYSRC NPCC CP9 RSWG Kathleen Goodman – ISO-NE Cinod Kotecha	Yes Yes Yes Yes Yes		The NYSRC suggests that the effective date to comply with the Standards be six months from the date of their adoption by the Board. We feel that all the standards should go through a field test. Lack of performing a completed field test process and implementation is the reason why they were ommitted from the Version 0 Standards. This has not yet been addressed. Furthermore, although the standards have some laudable reliability requirements there may not, at this time, be sufficient standards and processes available to allow entities to achieve compliance with the reliability objective.
Response: The drafting team used comments from stakeholders to make a standard-by-standard, recommendation for when each standard should become effective. In some cases, the amount of preparation time is as short as three months, and in some cases, the amount of preparation time is several years. Some of these standards were field tested as part of the now-retired process used for developing the original Planning Standards, and some were not field tested. Field testing is not needed for all standards. Some stakeholders did indicate that there aren't established processes to achieve some of the requirements. In these cases, the drafting team used the comments to either recommend field testing or to recommend that the standard not be developed until these processes have been established.			
IESO – Ontario	Yes		We suggest that the effective date to comply with the Standards be 6 months from the date of their adoption by the Board. We feel that all the standards should go through a field test. Lack of performing a completed field test process and implementation is the reason why they were omitted from the Version 0 Standards. This has not yet been addressed.
Response: The drafting team used comments from stakeholders to make a standard-by-standard, recommendation for when each standard should become effective. In some cases, the amount of preparation time is as short as three months, and in some cases, the amount of preparation time is several years. Some of these standards were field tested as part of the now-retired process used for developing the original Planning Standards, and some were not field tested. Field testing is not needed for all standards.			
Ed Riley – California ISO	Yes		All the standards should go through a field test. Lack of performing a completed

Other Comments on the Standards

Commenters	Comment

ISO/RTO Council Standards Review Committee	Yes		field test process and implementation is the reason why they were omitted from the Version 0 Standards. This has not yet been addressed. Furthermore, although the standards have some laudable reliability requirements there may not, at this time, be sufficient standards and processes available to allow entities to achieve compliance with the reliability objective.
Response: Some of these standards were field tested as part of the now-retired process used for developing the original Planning Standards, and some were not field tested. Field testing is not needed for all standards. Some of these standards were field tested as part of the now-retired process used for developing the original Planning Standards, and some were not field tested. Field testing is not needed for all standards.			

Other Comments on the Standards

Commenters	Comment

Comments Not Specific to any Standard:

Note that there were many comments submitted in response to the question – Do you have any other comments on the standards? Where the comments were made with a reference to a specific standard, the comment and its consideration have been addressed in the series of comments submitted on that standard. The comments that were moved to individual standards are preceded by 'Q4 – Other Comments'. The comments below are more general and address the format for standards, balloting, and other issues.

Data Coordination Working Group	The DCWG members listed above are representatives of NERC regions or subregions. Other DCWG group members, such as EIA liaisons and industry representatives, either were not polled or did not submit comments.
Response: No answer needed	
NERC Interconnection Dynamics Working Group	IDWG marked DO NOT AGREE with translation for instances where changes are suggested.. it may be an accurate portrayal of the original standard but is lacking or deficient. IDWG is developing a new set of DME SARs, which are to be completed by June 30, 2005.
Response: The comments from the IDWG were used to modify PRC-002 and PRC-018. The IDWG is encouraged to review the revised standards and see if it still feels it needs to submit separate SARs.	
Karl Kohlrus - City Water, Light & Power	The numbering system of the new standards is confusing. It needs to be revisited.
Response: The numbering of the standards was modified during the development of Version 0 standards and did receive stakeholder comments. This numbering system is not expected to change, and is explained at the following site: ftp://www.nerc.com/pub/sys/all_updl/standards/sar/Numbering_Convention_of_NERC_Reliability_Standards.pdf	
SERC EC Planning Standards Subcommittee	The PSS recommends individual balloting of these standards

Other Comments on the Standards

Commenters	Comment
(PSS)	
Response: The drafting team will be considering the best way of balloting these standards. Some standards are tightly linked, and should be balloted as a cluster because one standard is dependent upon another. The drafting team will not ballot the entire set of Phase III & IV standards as a single cluster as was done with Version 0.	
Ronnie Frizzell - Arkansas Electric Coop. Corp.	1. It is my understanding that the compliance group determines the levels of compliance. Did the changes in these sections of the drafts come from the drafting team or the compliance group? If they came from the drafting team will the compliance group review and possibly rewrite these sections? 2. In many of the standards the old standard and measures are referenced in parenthesis. Is it correct to assume this was done to help with the mapping process and will be removed in the final draft?
Response: The compliance group does not determine the levels of compliance. At this point in time, the drafting team is assigned that responsibility, using input from all stakeholders, including compliance groups. The compliance groups are encouraged to comment on the standards. The parenthetical references were intended to only be included in the set of documents that showed the relationship between the original planning standards and the proposed standards. These references were intended to help with the mapping process and have all been removed from the second draft.	
SERC EC Generation Subcommittee (GS) Jerry Nicely – TVA Nuclear Generation	To better facilitate review of draft standards, the members of the SERC GS recommend that standards applicable to GOs and GOPs be grouped together.
Response: The drafting team subdivided the standards into logical 'clusters'. These clusters group related standards together – but in some cases the 'cluster' includes the requirements for the RRO to write procedures along with the requirements for the Generator Owners to comply with those procedures. The drafting team will add bookmarks to the documents to try and make it easier for you to find the standards that are applicable to Generator Owners and Generator Operators.	
Individual	1 - NERC Standards are currently being drafted under a number of different formats. This is very confusing to the industry in

Other Comments on the Standards

Commenters	Comment
Members of CCMC	trying to review the material. For example, the original Operating and Planning Templates had the standard or requirement as the high level description of the document and the measure as a more detailed discussion of what was to be done. Compliance was then based on what was being measured. Now we are drafting the standards with all the details contained in the requirements section and the measure section merely being how the requirements are to be measured such as providing evidence that a requirement was followed or through a review of the documentation which is described in the requirement. Occasionally an additional requirement is added to the measures, such as requiring information be available in 30 days. The drafts of these Phase III/IV standards are a mix of both the old and the new format. Before going forward NERC needs to ensure that a single common format will be used and then have all of these documents re-drafted in compliance with that format. 2 - Throughout these drafts, the authors have added requirements such as the document will be made available for review within 30 days of a request. If these are to be standards then each and every one of them will be reviewed on a cyclic basis and at times as a spot audit. This requirement to provide a document, log, etc. within 30 days is therefore not needed and should be removed everywhere is occurs. The 30 day stated requirement actually creates a problem for requesting information in a short time period such as a spot audit. A similar requirement to distribute a document within 30 days of a change should also be eliminated or changed to reflect the actual time period “needed” for reliable operation. 3 - Each of the standards should be reviewed individually and balloted individually. In fact as each standard is being posted for public comment again, the industry should be asked to approve each of the requirements contained in the standard. In that way we would no longer have a conversion of the old policies and planning standards but an industry support for the reliability requirements, and not just the general reliability standards. Continual questioning of the “translation accuracy” keeps inferring that this is another Version 0. 4 - The standards that delegate the real obligations/requirements to the Regions to develop need to be changed. If the Regions are the entities to establish requirements, the Regions should simply make such requirements a part of their own compliance programs and not NERC Standards. However, Regions have the option of adding Regional Standards to the NERC Standards as Regional Differences as described in the Standards Process Manual.
Response: Because there are different drafting teams working on the standards in parallel, and each team must be responsive to the comments submitted by stakeholders, it is likely that the ‘format’ of phrases will continue to be a bit different. As long as the content is clear, this does not seem an insurmountable problem. As we gain experience with this process, there should be improvements in the standardization of format between standards. The standards sometime require a document be provided within 30 days of a request in the requirement- and sometimes in a measure. When the phrase, ’30 days of a request’ appears in the requirement, this is intended to be an actual requirement, and should be used in situations where the documentation is needed for reliability. When ’30 days of a request’ appears in a measure but not in the requirement, the 30 days is intended to	

Other Comments on the Standards

Commenters	Comment
	be a 'measure' of whether the documentation was provided within a reasonable time from when it was requested. Although there may be some inconsistencies, this is the 'standard format' that the drafting teams have been trying to follow. Some drafting teams have strayed from this format because of stakeholder comments requesting the '30 days' appear in both the requirement and the measure. The drafting team will be considering the best way of balloting these standards. Some standards are tightly linked, and should be balloted as a cluster because one standard is dependent upon another. The drafting team will not ballot the entire set of Phase III & IV standards as a single cluster as was done with Version 0. There are many standards that require the RROs to develop procedures for other entities to follow. The drafting team tried to establish the minimum requirements that must be included in the RRO procedures, and will hold the RRO responsible for developing procedures that contain these requirements. In most cases, the responsibility for developing the procedures has been assigned to the RRO because the procedures need to reflect consideration of local operating constraints and developing a NERC procedure would most likely be too restrictive for some entities and not restrictive enough for other entities.
Cinod Kotecha Consolidated Edison Kathleen Goodman – ISO-NE Alan Adamson – NYSRC IESO – Ontario ISO/RTO Council Standards Review Committee NPCC CP9 RSWG	Many of the proposed Phase III/IV standards are revisions of Version 0 standards that have been adopted. However, the clean versions of these standards do not indicate such. Therefore, we suggest that the second sentence on the first page of each of these standards be revised as follows: " This proposed standard is a revision of _____, which translates planning measure(s) _____. This (These) measure(s) was (were) not included ….."
	Response: The suggested change was adopted and is reflected in the revised standards.

Other Comments on the Standards

Commenters	Comment
NERC System Protection and Controls Task Force	Scopes are not clear in all cases. These standards do not specify the voltage levels to which they apply. Reference to the bulk electric system without a clear definition can be confusing, at best.
Response: When the term, 'Bulk Electric System' is capitalized, this means that the word is defined in the glossary for Reliability Standards. The definition of Bulk Electric System was approved with Version 0 Standards and is: As defined by the Regional Reliability Organization, the electrical generation resources, transmission lines, interconnections with neighboring systems, and associated equipment, generally operated at voltages of 100 kV or higher. Radial transmission facilities serving only load with one transmission source are generally not included in this definition.	
Xcel Energy – Northern States Power	With the intended adoption of all of these standards at one specific time, there is a concern about coordination of standards that are the responsibilitiy of the Regional Reliability Organization, with those that are the responsibility of an individual entity (e.g. Transmission Owner, Transmission Operator, Generation Owner, etc.) There are relationships contained in a number of these standards where compliance by the individual entities should not commence until the Standards applicable to Regional Reliability Organizations are in place and the Regional Reliability Organization has distributed their requirements to their respective individual entities.
Response: Because some of the standards are being recommended for field testing, it is unlikely that they will all be ready approved by the Ballot Pool and adopted by the NERC Board at the same time. The proposed Implementation Plan provides a proposed 'effective date' for each of the standards that is expected to move forward without field testing. In each case where there is a 'cluster' of related standards where one standard requires the RRO to develop requirements or procedures, and another standard requires compliance with the RRO's requirements or procedures, the drafting team has recommended several months or longer between the two effective dates. This supports your suggestion.	
Mark Kuras – MAAC	Recommend not using the word …evidence… It implies something beyond the required documentation. It has legal connotations. Suggest …business documents… instead. We used this wording during drafting of the cyber standards.
Response: The word, 'evidence' was used to be as open-ended as possible in allowing entities to use whatever processes are in place today. Evidence can be something besides paper – it can be lines of code in a software program, a screen display, a voice recording, etc. The drafting teams are trying to avoid requiring any entity to change an existing process to make it easier to measure compliance unless that process will also result in an improvement to reliability. The word 'evidence' has been used in many other standards, including Version 0, and seems to meet the approval of most stakeholders.	
Midwest	1. All of the different versions that were made available by NERC for the Version 1 standards (comparison documents, clean

Other Comments on the Standards

Commenters	Comment
Reliability Organization	documents, marked-up documents) had inconsistencies between the versions. The comments made here are based on the clean documents. 2. Unless otherwise intended that all items were to apply, for all standards where there are mulitiple items of non-compliance listed within one level, they should be preceded with the phrase, "There shall be a level XX non-compliance if any of the following conditions exist:" 3. There are many locations within the standards where inconsistencies exist for the standards referring to themselves. In some instances, the standards will refer to themselves as, for example, "MOD-016-1 R1". At other times, it will be "MOD-016-1_R1". At other times, it is simply "MOD-16-1", or may refer to the old Version 0 standard as "MOD-016". This language needs to be standardized throughout all of the standards, especially eliminating any references to Version 0 standards that are not anticipated to exist. Recommend that documents refer to themselves with full version 1 names (i.e, MOD-016-1). 4. There is confusion regarding the effective date of the standard and how quickly the entity that the standard is applicable to is required to be compliant. For example, for most of these standards, the entity that the standard is applicable to would appear to have 30 calendar days to respond to a request for compliance. The monitoring entity could, theoretically, request data on November 2 for a standard that takes effect on November 1. Does this mean that these entities have 30 days to comply with the standards? Recommend that an additional date be added to each of these standards entitled "Required Implementation Date". This date would be set 1 year (or other acceptable time-frame) beyond the effective date of the standard, allowing time for each entity to comply with the standard, before being monitored for the standard. 5. It is observed throughout the different standards that many of the Requirements do not have a corresponding Measure. It would provide additional clarification if each Requirement had a corresponding Measure (i.e., EOP-005). 6. Recommend that all standards that have related standards include a reference to the related standards (i.e, MOD-016-1 would include a reference to MOD-017-0 as a related standard). 7. Enhancements to these standards need to be considered for non-synchronous (e.g. wind) generation. 8. Some of the NERC standards have Requirements that are not fully addressed by associated Measures. Recommend that for all NERC standards each Measure indicate which Requirement(s) it is addressing. All Requirements should be fully addressed by the Measures. 9. Making the "Regional Reliability Organization" the applicable entity in MOD-016-1, MOD-023-1, PRC-002-1, PRC-003-1,.PRC-020-1,PRC-023-1, and VAR-004-1 is inconsistent with the NERC Functional Model. These standards should be changed to make them applicable to the appropriate entity within the Functional Model. 10. The words "affect"(ed) and "effect"(ed) are, at times, inappropriately interchanged throughout the standards.
Response: There were inconsistencies in the ‘red line’ and ‘clean’ versions of the documents.	

Other Comments on the Standards

Commenters	Comment

The phrase, 'There shall be a xx level non-compliance if .. of the following conditions exists' was used in the levels of non-compliance for the revised standards.

NERC Staff adopted the following format for referencing requirements and measures within and between standards:

> Referring to another reliability standard within one standard:
> Reliability Standard PRC-002
>
> Referring to a particular requirement in another standard:
> Reliability Standard PRC-002 Requirement 1.1 (or PRC-002 R1.1)
>
> Referring to a particular requirement or measure within the same standard:
> Requirement 1.1 (or R1.1)
> Measure 2.2 (or M2.2)
>
> The parenthetical reference above would be allowed if there are multiple references to the same standard, requirement or measure within the standard.

The 'effective date' for all the Phase III & IV standards is at least two months beyond the date the BOT adopts the standard. The effective date varies from standard to standard, and varies from requirement to requirement within a standard. Stakeholders submitted very helpful comments used by the drafting team in developing these proposed effective dates. If a requirement became 'effective' on January 1, 2007, then the responsible entity could be asked to provide data on January 1, 2007 – and if the requirement indicated the entity had 30 days to provide the data, then the data would need to be provided as requested by January 30, or the responsible entity would be non-compliant.

The scope of the Phase III & IV SARs limited the drafting team to working on requirements and measures that are associated with the Phase III & IV planning standards. Where a Phase III & IV measure was inserted into an already existing Version 0 Standard (such as EOP-005), the drafting team could not add measures for the Version 0 requirements as this is outside the scope of the Phase III & IV SARs.

Adding cross references that aren't absolutely needed only makes it more challenging to track all the intricacies of the relationships between the standards when there is a change to one of the standards, so the suggestion to add more cross references wasn't adopted. In the future, when NERC has a relational database for its reliability standards, this may be easier to implement.

Please be more specific in identifying what you feel should be modified with respect to non-synchronous generation.

As stated above, adding measures for Version 0 requirements is outside the scope of the Phase III & IV SARs.

During the development of Version 0 Standards, the Version 0 Planning Drafting Team members discovered that the Functional Model's definition for the Planning Authority does not include any restrictions on the size of the area addressed by the Planning Authority. Until this is addressed, if the requirements that need to be addressed from a wide area are assigned to the Planning Authority, the requirements may not achieve their intended purpose. The Phase III & IV Drafting Team members adopted the same approach – until the role of the Planning Authority is better

Other Comments on the Standards

Commenters	Comment
	defined, requirements that need a 'wide area' approach should be assigned to the RRO. Please be more specific in identifying areas where 'affected' and 'effected' are improperly used.
Transmission Issues Subcommittee	1. In general, there should be field testing of thse Phase III/IV standards to ensure the validity of the reqirements, as was done for the Phase I and Phase II standards. 2. The requirement for the RRO to present its procedures to NERC for review should be consistent throughout these standards.
	Response: Phase III were field tested already and some Phase IV standards were implemented by some entities. We are trying to minimize use of resources by field testing only where needed. In most cases the drafting team removed specific references that required the RRO to present its procedures to NERC because NERC is the Compliance Monitor for the RRO and already has the right to request these procedures as it monitors for compliance.
Gerald Rheault – Manitoba Hydro	The levels of compliance are inconsistent across the standards. WHile it is not resonable to expect consistency for widely different standards, there should be consistency for related standards. Many of the standards do not use the Functional Model definitions. An example is that the RRO is often the responsible entity when it should be the Planning Authority. NERC Staff
	Response: Please be as specific as possible in identifying where you think the drafting team should make modifications to the levels of non-compliance. During the development of Version 0 Standards, the Version 0 Planning Drafting Team members discovered that the Functional Model's definition for the Planning Authority does not include any restrictions on the size of the area addressed by the Planning Authority. Until this is addressed, if the requirements that need to be addressed from a wide area are assigned to the Planning Authority, the requirements may not achieve their intended purpose. The Phase III & IV Drafting Team members adopted the same approach – until the role of the Planning Authority is better defined, requirements that need a 'wide area' approach should be assigned to the RRO.
Southern Company Generation Southern	General Comments on the Phase III-IV Standards: Prior to their approval, each element of these "new" standards should be examined carefully to ensure the burdens imposed on generators (cost, resources, additional documentation, etc.) are justified in terms of positive and measureable impacts on grid reliability. This is extremely important to the facility owners and operators, because noncompliance with these standards will ultimately result in penalties and sanctions. Furthermore, it is imperative that compliance be achieved without undue risks to the system and generator. In the process of expediting the

Other Comments on the Standards

Commenters	Comment
Company – Transmission	Phase III/IV standards development, and the limited partipation to date by generation experts within the industry, we are not confident that a thorough job is being done in these areas. In addition, because these standards are setting "new" requirements and will involve significant amount of additional work and documentation, it would be appropriate to allow ample time for the industry to come into compliance. We believe it is inappropriate to issue non-compliances against industry participants for a "new" standard at its implementation date.
Response: Please review the drafting team's proposed implementation plan which highlights specific requirements where the drafting team is recommending compliance be phased in over an extended period of time. In all cases where there are new requirements for generators to collect or verify data or information that hasn't been required in the past, the drafting team is recommending several years to come into compliance. In two cases, the drafting team is also recommending that before the standards are finalized, field testing be conducted so that generators can gain experience in adopting the processes needed to meet compliance.	
John Harris - Load Forecasting Working Group	The II.D standard directly addresses the impact of forecasting on overall reliability. New generation and transmission resources are built because of the level and timing of anticipated demand. Standard II.D.M1 through II.D.M12 address the consistency between actual and forecast demand as one way of judging whether anticipated load, and therefore the need for future generation and transmission capacity, is reasonable and adequate. Demand forecasting is uncertain because many of the factors affecting anticipated load (e.g., future economic growth, weather, conservation investment, industrial structure, locational employment, international competition, etc.) are not known with absolute certainty. Because the standards are to ensure overall reliability of the bulk electric system, and because resource reliability depends in part on forecasts of anticipated load, it is recommended that load serving entities be required to submit with their annual demand and net energy for load forecasts a brief description and discussion of the key uncertainties of their forecasts. A brief summary of the key demand uncertainties by each load serving entitiy will provide needed background for judging the reliabity of the forecast. Currently, no load serving entitiy is required to provide any uncertainty assessment with their demand and energy projections. The essence of ensuring future reliability requires a current assessment of key uncertainties and how such key uncertainties have been incorporated into the forecast of anticipated load and energy. Because of workloads and other priorities of load serving entities, we emphasize the word 'brief' used in the above request for describing and discussing key forecast uncertainties. The requirement in II.D.M4 (4) that annual peak demand and net energy for load be provided for 'at least 5 years and up to 10 years' is inadequate. Coal-fired and nuclear generation resources are now being discussed as substitutes for gas-fired generation due to anticipated natural gas pricing Coal and nuclear resources have much longer planning, pre-engineering, and construction times that require longer forecast horizons than 5 years. Accordingly, the II.D.M4(4) requirement should be changed to 'at least 10 years'.

Other Comments on the Standards

Commenters	Comment
Response: IIDM1 and IIDM4 were not in the set of Phase III & IV Measures associated with this set of SARs, and writing requirements for IIDM1 and IIDM4 is outside the scope of the work of the drafting team.	
Transmission Subcommittee	The Transmission Subcommittee compliments work and effort by the Phase III and IV Standard Drafting Team. The Transmission Subcommittee supports the draft standards within the Phase III and IV Standards SAR. Please consider the following comments that the Transmission Subcommittee asks or suggest to clarify or enhance the draft standards. TS Recommends Defining "Reactive Capability of Generating Unit(s)" - TS does not offer a recommendation for the definition. TS Recommends Defining "Voltage Schedule" as "Voltage Schedule - A voltage range or set-point as a specific bus." TS Recommends Defining "Reactive Power Schedule" as "REactive Power Schedule - A reactive power range or set-point at a specific location(s)." TS Recommends Defining "NERC" as it is used throughout the standards. Use M1, above, as an example. The TS does not offer a "NERC" definition.
Response: The drafting team avoided developing definitions for gross and net real and reactive power and suggested that definitions for these terms should be developed by the associated Region because these definitions will most likely contain some 'duration' component that can vary between Regions and may contain other qualifying factors such as ambient temperature. The same would be true for voltage schedule and reactive power schedule. Since there doesn't seem to be much confusion about 'NERC', the drafting team will not add a definition.	