

Background:

The Phase III & IV drafting team thanks all commenters who submitted comments on the third draft of VAR-001 through VAR-003 from Set Two of the Phase III & IV Standards. These three standards were posted for a third public comment period from March 1 through April 15, 2006. The SDT asked stakeholders to provide feedback on the standards through a special Standard Comment Form. There were 22 sets of comments, including comments from more than 82 different people 6 of the 9 Industry Segments, and all NERC Regions as shown in the table on the following pages.

Based on the comments received, the drafting team is recommending that the Standards Authorization Committee authorize moving two of these standards forward to balloting, and is recommending that VAR-003 be removed from the set of standards being developed by the Phase III & IV drafting team.

The drafting team made several format changes to the standards, and made the following changes to the requirements based on stakeholder comments:

VAR-001 – Voltage and Reactive Control:

- Added language to clarify what is intended with the term, ‘voltage schedule’
- Removed the requirement for the Transmission Operator to notify the Generator Operator when the Generator Operator is not following a voltage or reactive power schedule

VAR-002 – Generator Operation for Maintaining Network Voltage Schedules:

- Modified the requirement for the Generator Operator to obtain approval when it can’t meet a voltage or reactive power schedule to more accurately reflect that the Generator Operator is making a notification.
- Removed the timing component associated with complying with the Transmission Operator’s directives to provide greater flexibility
- Added the phrase, ‘or capability’ to clarify the types of changes that should prompt the Generator Operator to notify the Transmission Operator

VAR-003 - Assessment of Reactive Power Resources:

During the third posting of these standards, stakeholders indicated support for removing VAR-003 Assessment of Reactive Power Resources from the set of Phase III & IV standards moving forward for further development. VAR-003 contains duplicate requirements in the already implemented Version 0 (TPL-001 System Performance Under Normal Conditions, and TPL-002 System Performance Following Loss of a Single BES Element) standards. Stakeholders provided some suggestions for improving the requirements to assess reactive power resources and these comments will be provided to the drafting team that is currently working to improve the TPL series of standards.

This ‘Consideration of Comments’ document includes the comments on the standards that were submitted with the third posting of VAR-001 through VAR-003. In this document, stakeholder comments have been organized so that it is easier to see the summary of changes being requested of each standard. All comments received on the second draft of Phase III & IV Set Two 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 Vice President and Director of Standards, Gerry Cauley at 609-452-8060 or at gerry.cauley@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>.

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Organization	Industry Segment								
		1	2	3	4	5	6	7	8	9
Anita Lee	AESO		x							
Carol L. Krysevig	Allegheny Energy Supply Company, LLS					x				
William J. Smith	Allegheny Power	x								
Robert V. McGarrah	Ameren	x								
James H. Sorrels, Jr.	American Electric Power	x				x	x			
Jason Shaver	American Transmission Company LLC	x								
Baj Agrawal	APS	x								
Bill Mitchell	Atlantic City Electric	x								
Scott Waples	Avista Corp.	x								
Dave Rudolph	BEPC									
Rebecca Berdahl	BPAP									
Chuck Matthews	BPAT	x								
Lisa Szot	CAISO		x							
John Miller	Conectiv Energy Supply, Inc					x				
Mike Mayer	Delmarva Power & Light Company	x								
Vic Davis	Delmarva Power & Light Company	x								
Brian Moss	Duke Power Co.	x								

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Organization	Industry Segment								
		1	2	3	4	5	6	7	8	9
Greg Mason	Dynegy					x				
Ed Davis	Entergy Services, Inc	x								
Kham Vongkhamchanh	Entergy Services, Inc.	x								
Sam Jones	ERCOT		x							
Bill Bojorquez	ERCOT (NERC Standards Evaluation Committee)		x							
Mark Marcum	Fossil Power Group					x				
Bob Schoneck	FPL	x								
John Shaffer	FPL	x								
John Odom	FRCC		x							
Linda Campbell	FRCC		x							
Dick Pursley	GRE									
Ron Falsetti	IESO		x							
Peter Brandien	ISO-NE		x							
Dennis Florum	LES									
Tom Mielnik	MEC									
Robert Coish	MHEB									
Bill Phillips	MISO		x							
Terry Bilke	MISO		x							
Joe Knight	MRO		x							

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Organization	Industry Segment								
		1	2	3	4	5	6	7	8	9
Ken Goldsmith	MRO		x							
Alan Boesch	NPPD	x								
John Leland	NWE	x								
Michael C. Calimano	NYISO		x							
Mark Ringhausen	Old Dominion Electric Cooperative				x					
Todd Gosnell	OPPD									
Michael Sidiropoulos	PAC	x								
Ben Morris	PG&E	x								
Al DiCaprio	PJM		x							
David Thorne	Potomac Electric Power Company	x								
James Newton	Potomac Electric Power Company					x				
John Radman	Potomac Electric Power Company	x								
Richard Kafka	Potomac Electric Power Company	x								
Chris Reese	PSE	x								
David Thompson	River System Operations & Envir					x				
Mohan Kondragunta	SCE	x								
Art Brown	SCPSA (Santee Cooper)	x								
Pat Huntley	SERC		x							
Don DeBerry	SMUD	x								

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Organization	Industry Segment								
		1	2	3	4	5	6	7	8	9
Phil Kleckley	South Carolina Electric & Gas Co			x						
Don Akers	Southern Company Generation						x			
Joel Dison	Southern Company Generation						x			
Roman Carter	Southern Company Generation						x			
Tom Higgins	Southern Company Generation					x				
Bob Jones	Southern Company Services	x								
Jim Busbin	Southern Company Services	x								
Jim Griffith	Southern Company Services	x								
Jim Viikinsalo	Southern Company Services	x								
Keith Calhoun	Southern Company Services	x								
Marc M. Butts	Southern Company Services	x								
Terry Crawly	Southern Nuclear					x				
Wayne Guttormson	SPC									
Charles Yeung	SPP		x							
Dave Darden	Tampa Electric					x				
Dennis Chastain	Transmission Planning	x								
Charles Feagans	Transmission Reliability	x								
James Regg	Transmission Reliability	x								
Jennifer Weber	Transmission Reliability	x								

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Organization	Industry Segment								
		1	2	3	4	5	6	7	8	9
Walter E. Joly	TVA	x								
Jerry Nicely	TVA - Nuclear					x				
Deborah M. Linke	U.S. Bureau of Reclamation				x	x				
Darrick Moe	WAPA									
Leonard York	WAPA	x								
Steve Rueckert	WECC		x							
Jim Maenner	WPS									
Pam Oreschnick	XEL									

Index to Questions, Comments and Responses:

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6. Please provide any other comments on this set of standards (VAR-001, VAR-002, and VAR-003) that you haven't already provided.49

2. Do you agree with the changes made in VAR-001 (Voltage and Reactive Control to require the Transmission Operator to notify the Generator Operator when the Transmission Operator notes that the Generator Operator is not meeting a voltage or reactive schedule?)

Summary Consideration: VAR-001 is a 'Version 0' Standard and the drafting team's scope does not include making changes to the Version 0 requirements unless that change is associated with the addition of the Phase III & IV measures. Although most commenters agreed with the modifications made, some commenters indicated that the change was outside the scope of the drafting team's SARs and the drafting team reviewed the scope and determined that these commenters were correct. As a result, the drafting team removed R5.1 from the standard. Several commenters suggested modifying and merging Requirement 3 with Requirement 5 and this was done. This change clarifies that the Transmission Operator must specify voltage and reactive power schedules at the interconnection between the generator facility and the Transmission Owner's facilities. Other commenters suggested clarify what is meant by 'voltage schedule' and the drafting team added a footnote to clarify that a voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.

Commenter	Yes	No	Comment
Entergy Services, Inc. (1) Ed Davis		✓	<ol style="list-style-type: none"> 1. We suggest R2 be deleted. This requirement is really a requirement to operate within limits and there are many other standards already requiring Transmission Operators operate within limits. R2 is a vague restatement of those other requirements. If this R2 is not deleted then the authors need to define *sufficient reactive resources*, *normal conditions*, *contingency conditions*, and *Transmission Operator's share of the reactive requirements of the interconnecting transmission circuits*. 2. R3 requires the identification of *aggregated generating units required to comply as a plant rather than individual generators*. We recommend R3 be deleted as this requirement is not a reliability issue, it is a contractual or tariff issue. We agree with the premise that voltage or VAR requirements should not be specified at the individual generator level but at the generator station (or facility) interconnection level. The requirement that the Transmission Operator specify a voltage or reactive schedule is in R5 and does not need to be repeated in R3. If the industry needs to specify the point where the voltage schedule is maintained, then we suggest R5 be modified to state the *Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities*, and delete R3. 3. R6 is an OATT obligation, not a reliability requirement, and should be deleted from this reliability standard. 4. R7 contains a requirement that the TO know the status of *power system stabilizers*. Please delete *power system stabilizers* from this voltage and reactive control standard. It is inappropriate to have a requirement not associated with voltage or reactive control in this standard. 5. R8 contains the same requirements as R9 and R8 should be deleted. 6. R10 contains the same requirements as R2 and R10 should be deleted. R10.1 should be deleted as it is a system design characteristic that is used so the system can be operated

			<p>within limits. One of set of limits are the voltage limits. This design characteristic is required in order to meet many other standards, e.g. TOP-002 through TOP-008, and is not needed here.</p> <ol style="list-style-type: none"> 7. R11 should be deleted from this standard since this requirement is already included in several operate within limits requirements like TOP-007 R1, R2, and R3. 8. R13 should also be deleted from this standard since this requirement is already included in several operate within limits requirements like TOP-007 R1, R2, and R3. 9. There should be measures for each requirement and those measures should reflect the requirement. There should also be Levels of Non-Compliance for each requirement. Please add measures and Levels of Non-Compliance for each requirement. For instance, R1 has certain requirements which have no measures nor Levels on Non-Compliance associated with R1. If the content of R1 is important enough to be a requirement then the requirement should be measured and sanctioned.
<p>Response:</p> <ol style="list-style-type: none"> 1. R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) 2. The suggestion was adopted. 3. R6 is a Version 0 Requirement. (R3 in Version 0) 4. R7 is a Version 0 requirement. (R4 in Version 0) 7. R11 is a Version 0 (R8 in Version 0) 6. R10 is a Version 0 (R7 and R7.1 in Version 0) 5. R8 and R9 are Version 0 requirement. (R5 and R6 in Version 0) 8. R13 is a Version 0 (R10 in Version 0) 9. Agree. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved. 			
<p>ISO/RTO Council (2) Charles Yeung – SPP Al DiCaprio – PJM Sam Jones – ERCOT Ron Falsetti – IESO Peter Brandien – ISO-NE Bill Phillips – MISO Mike Calimano – NYISO Lisa Szot – CASSO</p>		<p>✓</p>	<ol style="list-style-type: none"> 1. Specific to R3 in VAR-001, it is unclear to us, as to what specifically it is that the aggregated generating units are required to comply with. We assume that it is the voltage or reactive power schedule that these aggregated generating units are required to comply with. If this assumption is correct, some of the R5 requirements should be either stipulated before R3 or R3 added as a sub-requirement of R5 as appropriate. Please clarify. 2. R3 as written may conflict with R5. The former requires that the aggregated generating units be required to comply as a plant rather than individual generators. The latter, however, requires that the TOP specify a voltage or reactive power schedule to be maintained by each non-exempt generator (rather than as a plant). The two requirements need to be consistent. 3. Measure M1 (for compliance with R5) may need to be revised according to any changes made in response to Comment (ii), above. 4. See Item 2 below. Also, the additional sub-requirement 5.1 is not appropriate. It adds another

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

NYISO (2) Michael C. Calimano			requirement (and possible non-compliance) on the TOP that isn't necessary. In R5 the TOP directs the generator action; in VAR-002 R2 and R3 the generator operator is required to keep the TOP informed about any changes in reactive. R5.1 basically says if the TOP told the GOP to do something and then doesn't go back and re-tell him again, then the TOP is non-compliant. Delete R5.1 5. The requirement to not deviate from schedule also requires the need to identify what level of deviation is acceptable. It would not seem appropriate to have no deviation as most voltage control system are subject to gains or droop that would cause voltages to deviate to some degree.
<p>Response:</p> <p>1, 2. R3 was re-worded and merged into R5. The original intent in R3 was to allow the transmission operator to specify the voltage or reactive schedule for a generating plant (such as for wind units) as opposed to for each individual unit.</p> <p>3. Even after the modification to merge R3 into R5, Measure 1 is still applicable without any additional changes.</p> <p>4. In some situations, the Transmission Operator will see the real-time voltage at the interconnection between the generator facility and the Transmission Owner's facilities but the generator operator may not have the capability to monitor the voltage at the same location from the same device. Because controlling voltage is a task assigned to the Transmission Operator, not the Generator Operator, this task is assigned to the TOP.</p> <p>5. Agree. Voltage schedules can include tolerance bands that may be pre-defined by the RRO or TOP.</p>			
Independent Electricity System Operator (2) Ron Falsetti		✓	Specific to R3 in VAR-001, it is unclear to us, as to what specifically it is that the aggregated generating units are required to comply with. We assume that it is the voltage or reactive power schedule that these aggregated generating units are required to comply with. If this assumption is correct, some of the R5 requirements should be either stipulated before R3 or R3 added as a sub-requirement of R5 as appropriate. Please clarify. R3 as written may conflict with R5. The former requires that the aggregated generating units be required to comply as a plant rather than individual generators. The latter, however, requires that the TOP specify a voltage or reactive power schedule to be maintained by each non-exempt generator (rather than as a plant). The two requirements need to be consistent. Measure M1 (for compliance with R5) may need to be revised according to any changes made in response to Comment (ii), above.
<p>Response:</p> <p>R3 was modified and merged into R5. The original intent in R3 was to allow the transmission operator to specify the voltage or reactive schedule for a generating plant (such as for wind units) as opposed to for each individual unit.</p> <p>Even after the modification to merge R3 into R5, Measure 1 is still applicable without any additional changes.</p>			
American Transm. Co LLC (1) Jason Shaver		✓	ATC does not agree with the additional requirements or language in requirements 5, 5.1 and measure 1. First, the SDT has expanded on the scope of the SAR to inject new requirements and measures. The SAR allowed the SDT to clarify existing requirements and measures, but did not give them the ability to add new requirements or measure. The additional language in

			<p>requirements 5 and 5.1 is really an expansion of the requirement not clarifying language. Second, Requirement 5.1 only requires a Transmission Operator to determine a reason for why a generator/plant is not satisfying its voltage or Reactive Power schedule, and they only have to do that if they noticed the problem. ATC feels that these additions are not needed for the reliable operations of the BES.</p> <p>ATC suggests the following changes to requirement 5.</p> <ol style="list-style-type: none"> 1. “Each Transmission Operator shall specify an interconnection voltage or Reactive Power schedule to be maintained. The Transmission Operator shall provide the interconnection voltage or Reactive Power schedule to the associated Generator Operator.” ATC feels that with the addition of the word “interconnection” is encompassing enough to cover both an individual unit or plant. By making this change the SDT can remove requirement 3 because the Generator Operator and Transmission Operator will determine the interconnection voltage or Reactive Power schedule. The schedule will identify if it is an individual unit or plant that is required to comply. 2. ATC suggests that requirement 5.1 be deleted. 3. Lastly, requirement 4 specifically states that generators or plants that are exempt are not required to meet requirement 5. If that is the case then the statement “...by each non-exempt generator”, which appears in the SDT draft, is not needed. This type of redundancy is not need and makes the standard harder to interpret.
<p>Response:</p> <ol style="list-style-type: none"> 1. R3 was modified and merged into R5. The original intent in R3 was to allow the transmission operator to specify the voltage or reactive schedule for a generating plant (such as for wind units) as opposed to for each individual unit. 2. The drafting team reviewed your comment and determined that you are correct. The proposed language in R5.1 did go beyond the scope of the measures assigned to the drafting team. The drafting team removed R5.1 from the revised standard, along with its associated measure and levels of non-compliance. 3. The drafting team removed the adjective, ‘non-exempt’ as suggested. 			
<p>Southern Co. Transm. 1) Marc M. Butts Jim Busbin Keith Calhoun Jim Griffith</p>	<p>✓</p>	<p>✓</p>	<p>This requirement (R5.1), while well-intentioned, does not seem to recognize that a Transmission Operator may not have a reliability need to take corrective action for every voltage schedule deviation that occurs, unless that deviation is outside of some range from the desired voltage set-point. On those occasions when system conditions are different than those forecast at the time the voltage schedule was established, it may actually enhance the reliability of a local area to have one or more plants deviate by some amount from their _normal_ voltage schedule for that time period. The Transmission Operator should be allowed to establish some formal criteria or bandwidth around a voltage set-point for which no compliance violation would exist, or otherwise be allowed to exercise some discretion in determining whether or not the observed deviation presents a risk to transmission system reliability.</p>
<p>Response: The drafting team removed R5.1 from the revised standard. Other commenters indicated that the language in R5.1 went beyond the scope of the measures assigned to the drafting team, and the drafting team determined that the commenters were correct.</p>			

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

A footnote was added to the standard to clarify that the voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.			
Florida Power & Light (1) John W. Shaffer		✓	
Old Dominion Electric Cooperative (5) Mark Ringhausen	✓		
Dynegy (5) Greg Mason	✓		
SERC EC Planning Standards Subcommittee Kham Vongkhamchanh Robert V. McGarrah – Ameren Brian Moss – Duke Phil Kleckley – SCE&G Art Brown – SCPSA Pat Huntley – SERC Bob Jones – SOCO	✓		
FRCC (2) Linda Campbell – FRCC Dave Darden – Tampa Elec. John Shaffer – FPL Bob Schoneck – FPL	✓		
Tampa Electric Co. (1) Dave Darden	✓		
Allegheny Power (1) William J. Smith	✓		
U.S. Bureau of Reclamation (4, 5) Deborah M. Linke	✓		
Southern Co. Gen. (6)	✓		

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Roman Carter Tom Higgins Terry Crawley – Nuclear Joel Dison			
Allegheny Energy Supply (5) Carol L. Krysevig	✓		
NERC Standards Evaluation Subcommittee Bill Bojorquez – ERCOT	✓		
Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg	✓		
Midwest Reliability Org. (2) Jim Maenner Al Boesch – NPPD (2) Terry Bilke – MISO (2) Bob Coish – MHEB (2) Dennis Florom – LES (2) Ken Goldsmith – ALT (2) Todd Gosnell – OPPD (2) W. Guttormson – SPC (2) Tom Mielnik – MEC (2) Darrick Moe – WAPA (2) P. Oreschnick – XEL (2) Dick Pursley – GRE (2) Dave Rudolph – BEPC (2) Joe Knight – MRO (2)	✓		

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27 additional MRO members not listed above.			
Pepco Holdings, Inc.–Affil. (1) Richard Kafka Evan Sage Alvin Depew Carl Kinsley – Delmarva	✓		
American Electric Power (1) James H. Sorrels, Jr.	✓		
WECC Reliability Subc. Scott Waples – Avista Mohan Kondragunta – SCE Baj Agrawal – APS Michael Sidiropoulos – PAC Chuck Matthews – BPAT Rebecca Berdahl – BPAP Ben Morris – PG&E Leonard York – WAPA John Leland – NEW Chris Reese – PSE Don DeBerry – SMUD Steve Rueckert – WECC	✓		

3. Please identify anything you believe needs to be modified before VAR-001 is balloted:

Commenter	Comment
Dynegy (5) Greg Mason	1. R5 This requirement needs to be modified to state that a voltage schedule must be a range of voltage (not a specific point voltage) and that the voltage schedule should take into account voltage measuring accuracy and the dynamics of system voltage. The response from the Phase III-IV Standard Drafting Team (on this previous comment) that the standard doesn't prevent the TOP from including a tolerance band in the schedule misses the point. The voltage schedule must be a range of voltage (and not a specific point voltage) for the Generation Operator to maintain the voltage schedule and thus comply with the R2 provisions of VAR-002-1 (i.e. a single point voltage schedule cannot be routinely maintained due to system dynamics).
<p>Response: The drafting team added a footnote to the standard to clarify that the voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.</p>	
SERC EC Planning Standards Subcommittee Kham Vongkhamchanh Robert V. McGarrah – Ameren Brian Moss – Duke Phil Kleckley – SCE&G Art Brown – SCPSA Pat Huntley – SERC Bob Jones – SOCO Old Dominion Electric Cooperative (5) Mark Ringhausen	Revise R.2 by deleting [acquire sufficient] and replacing with [manage available]. The requirements in R5 and R7.1 pertain to Transmission Operators. As R4 is currently written, it is not clear what the generator is exempted from.
<p>Response: R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the 'red line' is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) R4 is exempting generators from having to follow the identified requirements.</p>	
FRCC (2) Linda Campbell – FRCC Dave Darden – Tampa Elec. John Shaffer – FPL Bob Schoneck – FPL	VAR-001 contains requirements that are already included in other standards and does not provide measures for many of the requirements. The drafting team should review each requirement (R1-R13) and ensure that the requirements are not already included in another standard and ensure that each requirement is well defined with appropriate measures. In Measure M4 - the words "transformer tap change" should be "transformer tap" (delete the word "change" to make wording consistent with D.2.2.2). –
<p>Response:</p>	

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Commenter	Comment
	<p>Most of the requirements in VAR-001 were approved with Version 0. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p> <p>Transformer tap change should have been transformer tap and this has been corrected.</p>
<p>Tampa Electric Co. (1) Dave Darden</p>	<p>C.M4 transformer tap change should be transformer tap (delete the word change to make wording consistent with D.2.2.2).</p>
	<p>Response: Transformer tap change should have been transformer tap and this has been corrected.</p>
<p>Florida Power & Light (1) John W. Shaffer</p>	<p>The issues of establishing a voltage schedule, monitoring voltage regulator status and coordinating generating plant transformer taps addressed in Requirements R.5, R.7 and R.12 are important and should be brought into the Standards framework. There are 10 other Requirements in the draft VAR-001 that are difficult to measure or are redundant to other NERC Reliability Standards. VAR-001 needs to be rewritten so that it is similar and parallel to VAR-002.</p>
	<p>Response: Most of the requirements in VAR-001 were approved with Version 0. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p>
<p>NYISO (2) Michael C. Calimano</p>	<p>The NYISO would like to comment that the standard in its current form for VAR-001-1 does not follow the convention of assigning a specific measurement for each requirement in the standard. There are thirteen requirements and only four measurements. The standard should be edited to follow the convention as it will ensure that the requirements are more clear, defineable and measureable.</p> <p>R2, as written, gives the impression that it is the Transmission Operator's responsibility is to ensure that resources are added to the system to meet reactive power needs, rather than the Transmission Operator's responsibility to assess the needs of the system and to secure and commit available resources to meet the reactive power needs for reliable operation. R2 should require that TOP's shall assure the reactive resource are available for normal and emergency conditions.</p> <p>The intent of R3 is unclear. Is it included to prevent the reactive power output of a specific generator within a plant from being directly negated by the actions of another generator within the same plant? i.e. increased reactive power output at one generator being absorbed at another.</p> <p>The status of power system stabilizers described in R7 is not a voltage and reactive control issue, and should be removed from the standard.</p> <p>(R11 and R13 address topics regarding operation of the transmission system that are covered in the TOP group of standards, and should be removed from this standards.</p>
	<p>Response: Most of the requirements in VAR-001 were approved with Version 0. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p>

Commenter	Comment
	<p>R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0)</p> <p>R4 is exempting generators from having to follow the identified requirements.R3 was modified and merged with R5 – the original intent in R3 was to allow the transmission operator to specify the voltage or reactive schedule for a generating plant (such as for wind units) as opposed to for each individual unit.)</p> <p>R7 is a Version 0 Requirement. (R9)</p> <p>R11 is a Version 0 Requirement. (R8)</p> <p>R13 is a Version 0 Requirement. (R10)</p>
<p>Allegheny Power (1) William J. Smith</p>	<p>NERC defines a System Operating Limit as the value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria. System Operating Limits are based upon certain operating criteria. These include, but are not limited to:</p> <ul style="list-style-type: none"> * Facility Ratings (Applicable pre- and post-Contingency equipment or facility ratings) * Transient Stability Ratings (Applicable pre- and post-Contingency Stability Limits) * Voltage Stability Ratings (Applicable pre- and post-Contingency Voltage Stability) * System Voltage Limits (Applicable pre- and post-Contingency Voltage Limits) <p>NERC defines a Schedule is defined as: (Verb) To set up a plan or arrangement for an Interchange Transaction. (Noun) An Interchange Schedule.</p> <p>VAR-001 implies a voltage schedule is a System Operating Limit, however it does not fit the definition and would only be accurate if the schedule were the range between the high and low voltage limits. This would not be a desirable range for operation and consequently companies adopt 'voltage schedules' which are desirable but which are not Operating Limits. Deviation from a schedule of this type would not constitute unreliable operations and there should be no 'penalty' associated with the deviation. This standard should begin by clearly defining a Voltage Schedule and eliminate the confusion.</p>
	<p>Response:</p> <p>The drafting team did not capitalize the word, 'schedule' when used in the standard. This implies that the word is not the 'defined' term – when a 'defined' term is used it is capitalized in standards.</p> <p>The TOP can change the published voltage or reactive schedule whenever needed for system reliability. The drafting team added a footnote to the standard to clarify that a voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.</p>
<p>U.S. Bureau of Reclamation (4, 5) Deborah M. Linke</p>	<p>R2. We disagree with other comments made that “acquire sufficient reactive resources” should be replaced with “manage available reactive resources”. Manage available reactive resources makes it sound as if the Transmission Operator is a passive agent with respect to assessing and obtaining an adequate supply of reactive resources. The NERC Functional Model tasks the Transmission Operator with maintaining reliability of the transmission area and maintaining defined voltage profiles. Ahead of</p>

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Comment
	<p>time responsibilities include: Determines amount required and arranges for Interconnected Operations Services from Generator Owners to ensure voltage support (e.g. reactive supply from generation resources) in coordination with the Reliability Authority. Real time responsibilities include: Deploys reactive resources from Transmission Owners and generation Owners as interconnected Operations Services to maintain acceptable voltage profiles. We believe the proposed change will dilute these responsibilities.</p>
<p>Response: R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p>	
<p>Southern Co. Gen. (6) Roman Carter Tom Higgins Terry Crawley – Nuclear Joel Dison</p>	<p>In certain cases where a non-jurisdictional Generator is owned by the same Entity as the TOP function, there may not be a voltage/reactive schedule to follow (if Interconnection Agreement does not exist). Additionally, in certain cases, the Generator Operator (GOP) does not see or record voltages at the same location as the Transmission Operator (TOP). This will result in discrepancies in the voltages seen by the GOP and the TOP. In an effort to better comply with requirement (R5.1), the GOP should be privileged to voltage data (high-side bus voltage of the GSU) as seen by the TOP.</p>
<p>Response: If this situation described does exist, the standard allows the TOP to identify generators that are exempt from following a voltage or reactive power schedule. A voltage schedule is a target voltage to be maintained within a tolerance band during a specified period. Hopefully the accuracy mismatch between the two devices should not be greater than the tolerance bands.</p>	
<p>Southern Co. Transm. 1) Marc M. Butts Jim Busbin Keith Calhoun Jim Griffith</p>	<p>Requirement R6 seems to be a duplicate requirement of the ancillary services provisions as specified in Part I, Section 3 ("Ancillary Services") of the FERC pro-forma Open Access Transmission Tariff (OATT). The drafting team needs to ensure that no conflicts exist between requirement R6 and the reactive power provisions of any other FERC-approved OATT, both now and in the future as tariffs are modified (for those entities under FERC jurisdiction).</p>
<p>Response: Requirement 6 is a Version 0 requirement that was not added by this drafting team. (R3 in Version 0) Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another</p>	

Commenter	Comment
<p>drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p>	
<p>ISO/RTO Council (2) Charles Yeung – SPP Al DiCaprio – PJM Sam Jones – ERCOT Ron Falsetti – IESO Peter Brandien – ISO-NE Bill Phillips – MISO Mike Calimano – NYISO Lisa Szot – CASSO</p>	<p>While we recognize that the scope of the standard drafting team (SDT) is limited to the Standard Authorization Request (SAR), it is nonetheless tasked with 3 key activities that we view as paramount, which we believe were not adequately executed during the last round of commenting. They are:</p> <ul style="list-style-type: none"> a) tasked to translate reliability requirements from the phase III and IV standards; b) tasked to "resolve technical comments" as necessary to achieve consensus but not introduce new reliability requirements; and c) tasked to develop the requirements and "measures" within these phase III and IV standards <p>In the context of the above tasks in particular b) and c) we offer the following:</p> <ol style="list-style-type: none"> 1. (In our view, requirement R1, which requires development of formal policies and procedures for monitoring and control voltage level and MVAR flows, is one of the more critical requirements, to ensure system reliability related to voltage performance. Yet there are no measures to assess TOP's compliance with this requirement. We suggest that appropriate measures be developed for this requirement before this standard proceeds to balloting. Remove M1 or re-word it to reflect what is needed in R 1 2. Specific to R7; while we recognize the significance of and the need for a TOP to know the status of power system stabilizers, we fail to understand this need from a voltage control perspective for which this standard is designed. Please clarify or remove this from R7. 3. The term "acquire" in requirement R2 has the connotation a TOP is required to 'PURCHASE' reactive resources. While, it is our view the obligation of the TOP is to "assure" sufficient reactive resources are available. This is accomplished through the appropriate planning of the system (TPL series of standards) and the operational planning processes (TOP-002). We suggest changing the requirement accordingly to read "assure sufficient reactive resources are available within its Area..." R2 and R6 seem to say the same thing, only one of these entities should be held accountable 4. R5; The use of the term "Schedule" seems to preclude the option of TOPs establishing and using pre-defined reactive power capability and AVR performance criterion for generator operators to adhere to. The IRC recommends the requirement be revised to read "Each Transmission Operator shall specify voltage or reactive schedules to be maintained by or reactive power capability/AVR performance criterion for each non-exempt generator or aggregated plant'. Similar changes are required throughout VAR-001 and VAR-002. 5. R8 and R9 appear to be relatively similar. Suggest combining. 6. R11; While we agree with the statement "IROL violations must be corrected within 30 minutes", we question the appropriateness of its inclusion in this standard rather than just referencing existing NERC standards? R11 should be eliminated since it is already covered in standards TOP-001,

Commenter	Comment
	<p>002, 003, 004, and 007. Similarly, Requirement R13, while true, is also addressed by TOP-007 R3.</p> <p>7. Requirement 10 duplicates the intent of R2. Both requirements address first contingency condition. R1 also addresses normal conditions and should therefore be retained. R10.1 is incorrect. Unlike MW reserves, reactive needs to be locational specific and not dispersed throughout the system (which is what R10.1 infers). R1 is clear that the system must be acceptable for normal and contingency conditions and therefore includes the need for local reactive.</p> <p>8. Requirement 3 is not needed. If the concern is that individual units may not be able to comply, then the existing requirements should be re-written to allow individual or plant response. and I think we need to clarify the intent. Perhaps words like ... So voltage schedules and reactive power schedules (not sure what this is) are assisting the system and resources are not fighting each other.</p> <p>9. R4 (and all of its sub-requirements 4.1 and 4.2) are not appropriate in this standard. A NERC standard shouldn't have individual TOPs developing their own unique set of exclusion criteria. If this is a NERC standard then all generators or plants should have the same criteria.</p> <p>10. R12 This requirement does not belong here in a voltage control standard. If this requirement is needed, it should be included in another standard and the decision to modify a generator fixed tap setting needs to be in coordination with the TOP's transmission planner, planning authority, and resource planner.</p> <p>11. Also the standard is not complete. As presented, it has 18 requirements or sub-requirements and only five of these requirements are measured (M1 evaluates both R5 and R5.1). Each requirement either needs to have a measure or a description as to why it isn't being measured (evaluated in another standard; not measurable as written; or suggest that it be eliminated). Each measure would then be expected to have at least one or more levels of non-compliance, which this and VAR-002 do not.</p> <p>12. Level 4 non-compliance: should be that the voltage or reactive power schedules were not provided to the "Generator Operators" (not owners).</p>
<p>Response:</p>	<p>1, 2, 3, 5, 6, 7, 11. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p> <p>R1 is a Version 0 requirement. (R1 in Version 0)</p> <p>R7 is a Version 0 requirement. (R4 in Version 0)</p> <p>R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the 'red line' is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0)</p> <p>R8 and R9 are Version 0 requirements. (R5 and R6 in Version 0)</p> <p>R10 is a Version 0 requirement. (R7 in Version 0)</p>

Commenter	Comment
	<p>4. The term schedule does not preclude the capabilities you have suggested. A footnote was added to the standard to clarify that the voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.</p> <p>8. Agree. Requirement 3 was modified and merged with Requirement 5.</p> <p>9. Since the TOP is responsible for maintaining voltage within its reliability area, it seems reasonable to give each TOP the discretion to develop exemption criteria specific to its area.</p> <p>10. Establishing tap settings for a step-up transformer does influence the ability to control voltage.</p> <p>12. This typographical error has been corrected.</p>
<p>NERC Standards Evaluation Subcommittee Bill Bojorquez – ERCOT</p>	<ol style="list-style-type: none"> 1. In general, the SES feels that this draft of VAR-001 while improved, is still not ready to be balloted. Our concern is over vague requirements such as R3, where the TOP is not required to have a criteria for aggregation and a lack of measurements required for each Requirement. 2. This draft of VAR-001 has 13 requirements yet only 4 measurements (of which, the SES does not find a strong link between reliability and the requirements of M2 and M4). The SES supports the approach proposed by the Compliance Elements Standard Drafting Team (CESDT) that states for each requirement, there should be at least one corresponding measure (the proposed VAR-002-1 has a measure for each requirement). The SES feels that if each SDT gave more consideration to the 'how' and 'what' to measure with regards to each requirement as the CESDT proposes; the language around each requirement should be improved, i.e., less wordy or less vague. <p>Specific Concerns:</p> <ol style="list-style-type: none"> 3. R2. The SES raised this concern in previous comments. The SES believes that R9 best satisfies the intent of R2 and therefore R2 should be deleted. The TOP can only operate the reactive resources that actually exist in their area regardless of whether the amount of resources installed and operational is adequate. How does the TOP "acquire sufficient reactive resources" if the existing resources are not adequate? The SES would like for the SDT to clarify who is responsible for "acquiring" these resources. As R2 is currently written, the SES believes the responsible party for acquiring sufficient reactive resources lies with the Transmission Planner and/or the Transmission Owner. However, if the wording of this standard is retained as is, the SES recommends the TOP be required to complete an operational study to verify that the voltage levels are protected under normal and contingency conditions. 4. R3. As noted above, the SES believes that the TOP should have a formal criteria for determining which generating units may be aggregated as a plant in addition to the notification requirement. Also, the SES asks the SDT to give consideration to defining "Plant" and recommends adding "with the requirements of this standard" after "to comply". 5. R7.1 add the words 'non-exempt' before Generator Operator to be consistent with R5. 6. R9 & R10. The SES recommends the SDT consider adding the contingency requirement of R10 to R9 and then delete R10.

Commenter	Comment
	<p>7. R13. As written, R13 implies that R2 will not be complied with. The SES recommends the SDT revise R13 by deleting the phrase "when reactive resources are insufficient". Measures. Discussed in previous paragraph.</p> <p>8. Levels of Non-Compliance: In general, the SES is concerned that for 13 requirements, there is only a scant 6 items which comprise non-compliance. We believe each Requirement should be assigned a level or levels of Non-compliance, much like our recommendation on Measures. The SES believes the proposed non-compliance levels proposed in VAR-001 appear to be sketchy at best. Also, specifically, the SES recommends that 2.3.1 be revised to be a Level 4 Non-Compliance and that the current Level 4 Non-Compliance item be revised to be a Level 3 Non-Compliance. The reasoning behind this is the SES believes that the non-existence of Voltage and Reactive Power Schedules in more detrimental than not having documentation showing the TOP has communicated the schedules to the GOPs.</p>
<p>Response:</p>	<p>1, 4. R3 was modified and merged into R5. The original intent in R3 was to allow the transmission operator to specify the voltage or reactive schedule for a generating plant (such as for wind units) as opposed to for each individual unit.</p> <p>2. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved. VAR-002 is a 'new' standard rather than a modified Version 0 standard, and thus contains all required elements (measures for every requirement, compliance monitoring information and levels of non-compliance.) 3.</p> <p>3. R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the 'red line' is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0)</p> <p>5. The drafting team removed the adjective, 'non-exempt' from R5 to be consistent with R7.1.</p> <p>6. R9 and R10 are both Version 0 requirements. (R6 and R7 in Version 0)</p> <p>7. R13 is a Version 0 requirement. (R10 in Version 0)</p> <p>8. The level three non-compliance was modified to clarify what was intended – level three intended to say that Voltage or Reactive Power schedules were provided for some but not all generating units as required in R5.</p>
<p>Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg</p>	<p>1. Generally, there appears to be a disproportionate quantity of compliance measures to requirements; i.e., 13+ requirements vs. 4 measures. In addition, the measures and compliance sections appear incomplete in that they the measures don't appear to encompass the requirements.</p> <p>2. Revise R2. replace 'acquire sufficient' with 'manage available'.</p> <p>3. Revise R5.1. replace 'obtain' with 'request'.</p> <p>4. Revise R7.1 replace 'direct' with 'monitor the Generator Operator's performance to ensure proper voltage and reactive schedules are maintained.'</p>

Commenter	Comment
	<p>Response:</p> <ol style="list-style-type: none"> 1. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved. 2. R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) 3. R5.1 was removed from the standard because it added a requirement that went beyond the scope of the measures assigned to this drafting team. 4. The intent was to clarify that the TOP has the authority to direct and the Generator Operator is required to comply.
<p>American Transm. Co LLC (1) Jason Shaver</p>	<ol style="list-style-type: none"> 1. Since requirement 2 lacks an associate measure, ATC feel that the SDT should remove this requirement from the standard. ATC is concerned with any requirement that lack specific measures detailing how an entity can demonstrate compliance. In addition, ATC feels that the SDT has expanded beyond the scope of the SAR with this requirement. Although the SDT is attempting to establish a noble requirement, lack of specifics leaves Transmission Operators vulnerable to volatile interpretation of the requirement. What would an Transmission Operator show to an auditor that it has “acquire sufficient reactive resources”? A look at the existing measures would offer nothing in answering that question. If the SDT feels that this requirement is needed a SAR should be drafted that would allow for a more complete standard to be written. <p>Comment on Levels of Non-Compliance:</p> <ol style="list-style-type: none"> 2. Level 3 is too drastic of a compliance level for failing to perform 2.3.2. Although ATC has requested that requirement 5.1 which is the requirement associated with 2.3.2, be removed from this standard failing to perform this action should not fall to a level 3 non-compliance. If the SDT chooses to keep requirement 5.1 then ATC request that failing to perform 5.1 should be a level 1 non-compliance. Requirement 5.1 states that only if a Transmission Operator sees a voltage or Reactive Power schedule not being meet they have to get a reason from the Generator Operator of why. A level 3 seems to be to drastic of non-compliance level for failure to obtain a reason. A Transmission Operator is completely exempt from 2.3.2 if they do not notice the voltage or Reactive Power schedule was not being satisfied.
	<p>Response:</p> <ol style="list-style-type: none"> 1. R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) 2. R5.1 was removed from the standard along with its associated measure and levels of non-compliance.

<p>Independent Electricity System Operator (2) Ron Falsetti</p>	<p>While the IESO recognizes that the scope of the standard drafting team (SDT) is limited to the Standard Authorization Request (SAR), it is nonetheless tasked with 3 key activities that we view as paramount, which we believe were not adequately executed during the last round of commenting. They are:</p> <ul style="list-style-type: none"> a) tasked to translate reliability requirements from the phase III and IV standards; b) tasked to "resolve technical comments" as necessary to achieve consensus but not introduce new reliability requirements; and c) tasked to develop the requirements and "measures" within these phase III and IV standards <p>In the context of the above tasks in particular b) and c) we offer the following:</p> <ol style="list-style-type: none"> 1. In our view, requirement R1, which requires development of formal policies and procedures for monitoring and control voltage level and MVAR flows, is one of the more critical requirements, to ensure system reliability related to voltage performance. Yet there are no measures to assess TOP's compliance with this requirement. We suggest that appropriate measures be developed for this requirement before this standard proceeds to balloting. 2. Specific to R7; while we recognize the significance of and the need for a TOP to know the status of power system stabilizers, we fail to understand this need from a voltage control perspective to which this standard is designed for. Please clarify or remove this from R7. 3. The term "acquire" in requirement R2 has the connotation a TOP is required to 'PURCHASE' reactive resources. While, it is our view the obligation of the TOP is to "assure" sufficient reactive resources are available. This is accomplished through the appropriate planning of the system (TPL series of standards) and the operational planning processes (TOP-002). We suggest changing the requirement accordingly to read "assure sufficient reactive resources are available within its Area..." 4. R5; The use of the term "Schedule" seems to preclude the option of TOPs establishing and using pre-defined reactive power capability and AVR performance criterion for generator operators to adhere to. The IESO recommends the requirement be revised to read "Each Transmission Operator shall specify voltage or reactive schedules to be maintained by or reactive power capability/AVR performance criterion for each non-exempt generator or aggregated plant'. Similar changes are required throughout VAR-001 and VAR-002. 5. R8 and R9 appear to be relatively similar. Suggest combining. 6. R11; While we agree with the statement "IROL violations must be corrected within 30 minutes", we question the appropriateness of its inclusion in this standard rather than just referencing standard TOP-007? If it is to remain it should state "return its transmission system to within IROL as soon as possible, but not longer than 30 minutes" to be consistent with TOP-007. 7. Similarly, Requirement R13 while true is also addressed by TOP-007 R3.
<p>Response:</p>	

<p>1, 2, 3, 5, 6, 7. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p> <p>R1 is a Version 0 requirement. (R1 in Version 0)</p> <p>R7 is a Version 0 requirement. (R4 in Version 0)</p> <p>R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0)</p> <p>R8 and R9 are Version 0 requirements. (R5 and R6 in Version 0)</p> <p>R11 is a Version 0 requirement. (R8 in Version 0)</p> <p>R13 is a Version 0 requirement (R10 in Version 0)</p> <p>4. The term schedule does not preclude the capabilities you have suggested. A footnote was added to the standard to clarify that the voltage schedule is a target voltage to be maintained within a tolerance band during a specified period.</p>	
<p>Midwest Reliability Org. (2) Jim Maenner Al Boesch – NPPD (2) Terry Bilke – MISO (2) Bob Coish – MHEB (2) Dennis Florom – LES (2) Ken Goldsmith – ALT (2) Todd Gosnell – OPPD (2) W. Guttormson – SPC (2) Tom Mielnik – MEC (2) Darrick Moe – WAPA (2) P. Oreschnick – XEL (2) Dick Pursley – GRE (2) Dave Rudolph – BEPC (2) Joe Knight – MRO (2) 27 additional MRO members not listed above.</p>	<ol style="list-style-type: none"> 1. Level 3 Non-Compliance (2.3.1) could be misinterpreted to mean that voltage and Reactive Power schedules did not exist for any generators, which the MRO does not think is the intent. For those schedules that do exist, the MRO assumes that they were also communicated. If this is the intent, then it should be made clear. 2. R11 is redundant to requirements in other standards and should be deleted from this standard. If however R11 is retained, the MRO believes that a Measurement corresponding to R11 needs to be added. 3. The MRO believes that R6 is covered in the Transmission Owner's tariff agreement, as such it is a business practice and should be removed. The MRO recommends that the SDT refer this issue to the NERC SAC. If the SAC decides to remove R6, then the PSE should be removed as an applicable entity from the standard.
<p>Response:</p> <ol style="list-style-type: none"> 1. The drafting team modified the wording in 2.3.1 to clarify the intent – the revised language says, “Voltage or Reactive Power schedules were provided for some but not all generating units as required in R5.” 2, 3. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 	

standards that were incomplete when approved. R11 is a Version 0 requirement. (R8 in Version 0) R6 is a Version 0 requirement. (R3 in Version 0)	
Pepco Holdings, Inc.–Affil. (1) Richard Kafka Evan Sage Alvin Depew Carl Kinsley – Delmarva	Specific Concerns: R2. R9 best satisfies the intent of R2 and therefore R2 should be deleted. The TOP operates, dispatches or has access to the reactive resources that exist in the area. The TOP does not: acquire sufficient reactive resources - that is a TO or TP function. However, the TOP may be required to complete an operational study to verify that the voltage levels are protected under normal and contingency conditions. R13. As written, R13 implies that R2 will not be complied with. The SDT should revise R13 by deleting the phrase: when reactive resources are insufficient.
Response: Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved. R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the 'red line' is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0) R9 is a Version 0 requirements. (R6 in Version 0) R13 is a Version 0 requirement (R10 in Version 0)	
Entergy Services, Inc. (1) Ed Davis	Please see our responses to Question 1 above.
Response: Please see the responses to your comments on Question 1.	
American Electric Power (1) James H. Sorrels, Jr.	<ol style="list-style-type: none"> 1. R13 should include the ability of the Transmission Operator to direct a generator to reduce MW in order to increase MVAR output before having to shed load in emergency situations, if such action is deemed appropriate by the Transmission Opeator. 2. The term "reactive power schedule" needs to be defined. As pointed out by a previous commenter during the 2nd posting, there is a difference in opinion in the industry as to what this term means. The Standard Drafting Team (STD) is incorrect if they think that just because few commenters stated the term should be defined or even commented in regards to the term, that such action is an indication that the industry has the same interpretation of this term as the STD. There are generation owner/operators that equate "reactive power schedule" to mean operating their excitation system in VAR control mode as opposed to automatic voltage control mode. We know this by first-hand experience as we operate in two Regions that have very specific Criteria language in this area. Since the 2003 Blackout, annually, we send a letter to all affiliated and non-affiliated generators connected to our system reminding them of the Region requirement to operate their excitation systems in automatic voltage control mode. 3. Each year, we receive feedback from at least one generator that they believed that if they had a "reactive power schedule" that that meant they could operate in VAR control mode. VAR-002-1 R1 requires the generator to operate in the automatic voltage control mode. However, we do not want a generator to interpret having an assigned reactive power schedule to be the same as

	<p>having an exemption to this requirement. We strongly suggest the SDT reconsider and include a definition of the term "reactive power schedule."</p>
<p>Response:</p> <ol style="list-style-type: none"> 1. Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved. R13 is a Version 0 requirement (R10 in Version 0) 2. A footnote was added to the standard to clarify that the voltage schedule is a target voltage to be maintained within a tolerance band during a specified period. 3. There is a requirement for the Generator Operator to operate in the automatic voltage control mode unless the generator has been exempt from complying with this requirement. The drafting team added some more words to R5 to clarify that the Generator Operator is required to comply with the voltage and reactive power schedules while operating in the AVR control mode. 	
<p>WECC Reliability Subc. Scott Waples – Avista Mohan Kondragunta – SCE Baj Agrawal – APS Michael Sidiropoulos – PAC Chuck Matthews – BPAT Rebecca Berdahl – BPAP Ben Morris – PG&E Leonard York – WAPA John Leland – NEW Chris Reese – PSE Don DeBerry – SMUD Steve Rueckert – WECC</p>	<p>WECC RS believes the terminology in R2 should be changed to say maintain the voltage levels rather than protect the voltage levels, for clarity purposes.</p>
<p>Response: Adding measures and compliance elements for the requirements that were developed as part of Version 0 is outside the scope of this drafting team. There is another drafting team in place that is working to add measures and compliance information to all the Version 0 standards that were incomplete when approved.</p> <p>R2 is a Version 0 Requirement. Note that this looks like it was modified by the Phase III & IV drafting team – but the ‘red line’ is due to a re-organization of the requirements within the standard between the second and third postings of the standard. (R2 in Version 0)</p>	

4. Do you agree with the modifications to the levels of non-compliance in VAR-002 (Generator Operation for Maintaining Network Voltage Schedules)?

Summary Consideration: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator’s directive and therefore disliked the associated levels of non-compliance. Commenters provided sound justification for allowing more latitude and the drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator’s directive – the Transmission Operator’s directive may include a time component but isn’t required to include a time component.

Commenter	Yes	No	Comment
NYISO (2) Michael C. Calimano		✓	The Levels of non-compliance are defining new requirements by including times which are different than the standard. The non-compliance evaluation must only be performed on the standard. If 5 minutes were to stay in this standard (and I hope it does not) then there shall be only one non-compliance: is it level 1 or level 4? Although the standard has six measures, non-compliance is not assessed on M1 or M3.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator’s directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator’s directive – the Transmission Operator may include, but is not required to include a time component in its directive. The drafting team added the missing measures and associated levels of non-compliance.</p>			
U.S. Bureau of Reclamation (4, 5) Deborah M. Linke		✓	R2.2 requires the Generator Operator to adjust voltage levels when directed to do so by the Transmission Operator, within 5 minutes. For large plants with many generators (e.g. large hydro plants that may have 16 or more generators) that must make the adjustments manually, it is not physically possible for the operators to implement the voltage change in 5 minutes. We recommend a longer time allowance for larger plants to make adjustments, e.g., 20-30 minutes. The time frames described in the Levels of Non-Compliance will need to be adjusted to provide for the longer time frames allowed to make the adjustments. However we believe this compliance metric, on a practical level, will be overly onerous to apply. It presumes someone is timing the generator operator and documenting how long it took to make the voltage adjustments as directed by the Transmission Operator. From an operational standpoint this approach does not seem practical.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator’s directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator’s directive – the Transmission Operator may include, but is not required to include a time component in its directive.</p>			
Southern Co. Gen. (6)		✓	1. Non- compliance needs to be clearly stated to be on a unit basis. For example, Ten or

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Commenter	Yes	No	Comment
Roman Carter Tom Higgins Terry Crawley – Nuclear Joel Dison			more incidents.. should be for a given unit. 1. There could be some concern with a couple of the Measures. For example, some generating plants may not have the means to record/log the voltage levels in which to prove the GO 'shall have evidence' that it did or did not comply. Most of the evidence to comply with the Measures cover items related to routine operations but, should a reportable event occur, these generating units may need to rely on the Transmission Operator's voltage data to show they did make attempts to comply. Having voltage data as explained in question 2 would help the GOP.
<p>Response: The levels of non-compliance have been modified so they are applied on an incident basis without regard to any specific unit. Agreed. A voltage schedule is a target voltage to be maintained within a tolerance band during a specified period. Hopefully the accuracy mismatch between the two devices should not be greater than the tolerance bands. There is nothing to preclude the Generator Operator from having an agreement with the Transmission Operator to share data that may be used as evidence.</p>			
Southern Co. Transm. 1) Marc M. Butts Jim Busbin Keith Calhoun Jim Griffith		✓	Non-compliance needs to be clearly stated as applicable on a generating unit or switchyard voltage basis. For example, -Ten or more incidents... should be for a given unit or kV level at the plant.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. This change should eliminate the need for your suggested change.</p>			
Allegheny Energy Supply (5) Carol L. Krysevig		✓	Compliance statement 2.1.1 does not agree with Requirement 2.2, 5 minutes versus 10 minutes.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but is not required to include a time component in its directive.</p>			
Independent Electricity System Operator (2) Ron Falsetti		✓	The Levels of non-compliance are defining new requirements by including times which are different than the standard. The non-compliance evaluation must only be performed on the standard. If 5 minutes were to stay in this standard (and I hope it does not) then there shall be only one non-compliance: is it level 1 or level 4? Although the standard has six measures, non-compliance is not assessed on M1 or M3.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but</p>			

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Commenter	Yes	No	Comment
<p>is not required to include a time component in its directive. The drafting team added the missing measures and associated levels of non-compliance.</p>			
Entergy Services, Inc. (1) Ed Davis		✓	Please remove from the Levels restatements of the requirements. We suggest the Levels be stated as - for instance - one incident of failing to meet R3. Also, there should also be Levels of Non-Compliance for each requirement.
<p>Response: The levels of non-compliance were shortened in support of your suggestion. The drafting team added the missing measures and associated levels of non-compliance.</p>			
WECC Reliability Subc. Scott Waples – Avista Mohan Kondragunta – SCE Baj Agrawal – APS Michael Sidiropoulos – PAC Chuck Matthews – BPAT Rebecca Berdahl – BPAP Ben Morris – PG&E Leonard York – WAPA John Leland – NEW Chris Reese – PSE Don DeBerry – SMUD Steve Rueckert – WECC		✓	Amount of time allowed to comply is too restrictive. R2.2 requires the generator operator to comply or provide an explanation of why the schedule can not be met within 5 minutes. The levels of non-compliance do not appear to allow for explanations of why the schedule can not be met.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but is not required to include a time component in its directive. The revised standard does not require the Generator Operator to provide an explanation of why a schedule cannot be met.</p>			
ISO/RTO Council (2) Charles Yeung – SPP Al DiCaprio – PJM Sam Jones – ERCOT Ron Falsetti – IESO Peter Brandien – ISO-NE Bill Phillips – MISO Mike Calimano – NYISO	✓	✓	The Levels of non-compliance are defining new requirements by including times which are different than the standard. The non-compliance evaluation must only be performed on the standard. If 5 minutes were to stay in this standard (and I hope it does not) then there shall be only one non-compliance: is it level 1 or level 4?

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Commenter	Yes	No	Comment
Lisa Szot – CASSO			
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but is not required to include a time component in its directive.</p>			
Dyegy (5) Greg Mason	✓		Yes, conceptually. However, per my comments on VAR-002-1 below, the times in D2.1.1-D2.4.1 need to be lengthened.
<p>Response: Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but is not required to include a time component in its directive.</p>			
Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg	✓		Levels of Non-Compliance: Limiting non-compliance to only those situations where the Generator Operator fails to comply with the Transmission Operator's directive implies that the Generator Operator is non-compliant only when the Transmission Operator notifies or calls. The non-compliance should be expanded to include any time the voltage shedule is not maintained.
<p>Response: Note that VAR-001 was modified to eliminate the Transmission Operator's requirement to notify the Generator Operator when the Generator Operator fails to meet the voltage or reactive power schedule. The measures were developed to avoid requiring a phenomenal amount of documentation.</p>			
Midwest Reliability Org. (2) Jim Maenner Al Boesch – NPPD (2) Terry Bilke – MISO (2) Bob Coish – MHEB (2) Dennis Florom – LES (2) Ken Goldsmith – ALT (2) Todd Gosnell – OPPD (2) W. Guttormson – SPC (2) Tom Mielnik – MEC (2)	✓		The MRO commends the SDT for clarifying the Non-Compliance Levels. Specifically relating to how the Non-Compliance levels for the Generator Owner were identified separately from the Generator Operator.

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Commenter	Yes	No	Comment
Darrick Moe – WAPA (2) P. Oreschnick – XEL (2) Dick Pursley – GRE (2) Dave Rudolph – BEPC (2) Joe Knight – MRO (2) 27 additional MRO members not listed above.			
Response: Thank you for your support.			
Old Dominion Electric Cooperative (5) Mark Ringhausen	✓		
SERC EC Planning Standards Subcommittee Kham Vongkhamchanh Robert V. McGarrah – Ameren Brian Moss – Duke Phil Kleckley – SCE&G Art Brown – SCPSA Pat Huntley – SERC Bob Jones – SOCO	✓		
FRCC (2) Linda Campbell – FRCC Dave Darden – Tampa Elec. John Shaffer – FPL Bob Schoneck – FPL	✓		
Florida Power & Light (1) John W. Shaffer	✓		
Tampa Electric Co. (1) Dave Darden	✓		
Allegheny Power (1) William J. Smith	✓		

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Committer	Yes	No	Comment
NERC Standards Evaluation Subcommittee Bill Bojorquez – ERCOT	✓		
Pepco Holdings, Inc.–Affil. (1) Richard Kafka Evan Sage Alvin Depew Carl Kinsley – Delmarva	✓		
American Electric Power (1) James H. Sorrels, Jr.	✓		

5. Please identify anything you believe needs to be modified before VAR-002 is balloted:

Commenter	Comment
Old Dominion Electric Cooperative (5) Mark Ringhausen	M2 should be deleted since it is sufficiently covered by M3.
<p>Response: These are measuring two different things. The standard was modified to add the specific references to the requirements to make this more clear.</p>	
Dynergy (5) Greg Mason	<p>1.R1 needs to be modified to replace the wording "otherwise approved by " with " it has otherwise notified" to be consistent with R3 (which requires "notification" of the TO and not "approval" of the TO) and the practicalities of system operation. Obtaining "approval" of the Transmission Operator before the voltage regulator is taken off automatic voltage control mode may not always be possible given equipment failures and priorities of real time operations.</p> <p>2. R2.2. The wording "voltage output" needs to be replaced with " unit or plant voltage" since generators have var "output" and not "voltage output".</p> <p>3. R2.2. The 5 minute system response requirement to change voltage to a new level in accordance with a TO request is simply too short and is not likely to be physically or practically attainable in many instances. The 5 minute requirement needs to be replaced by a more reasonably achievable timeframe of 15 minutes.</p> <p>4. M1 Consistent with comment #1, the wording "received approval of " in M1 needs to be replaced with "notified". Also, with this change, M1 really needs to be deleted as it is redundant to M4.</p> <p>5. D2 Consistent with comment #3, the times specified in 2.1.1,2.2.1,2.3. 1 and 2.4.1 need to be changed to 20 minutes, 25 minutes, 30 minutes and 35 minutes,respectively.</p>
<p>Response:</p> <ol style="list-style-type: none"> The drafting team adopted your suggestion and modified the language in R1. The drafting team adopted your suggestion and removed the word, 'output' from R2.2. In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive. M1 was modified in support of your suggestion. Most commenters indicated that they disliked the requirement for the Generator Operator to modify voltage within 5 minutes of a Transmission Operator's directive and therefore disliked the associated levels of non-compliance. The drafting team modified the requirement so that the Generator Operator is required to comply with the Transmission Operator's directive – the Transmission Operator may include, but is not required to include a time component in its directive. 	
SERC EC Planning Standards Subcommittee	M2 should be deleted since it is sufficiently covered by M3.

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Commenter	Comment
Kham Vongkhamchanh Robert V. McGarrah – Ameren Brian Moss – Duke Phil Kleckley – SCE&G Art Brown – SCPSA Pat Huntley – SERC Bob Jones – SOCO	
<p>Response: These are measuring two different things. The standard was modified to add the specific references to the requirements to make this more clear.</p>	
NYISO (2) Michael C. Calimano ISO/RTO Council (2) Charles Yeung – SPP Al DiCaprio – PJM Sam Jones – ERCOT Ron Falsetti – IESO Peter Brandien – ISO-NE Bill Phillips – MISO Mike Calimano – NYISO Lisa Szot – CASSO	<ol style="list-style-type: none"> 2. Ref. our general concern and comment (ii) on Question 2, above. If the requirement to report power system stabilizer status is indeed removed as suggested from VAR-001, then R3.1 in VAR-002 would need to be revised accordingly. 3. Also reference Comment (iv) to Question 2, above. 4. R2 Suggest using the term 'required by' instead of "directed by' the Transmission Operator to better reflect practical applications where TOP defines reactive power capabilities and AVR performance criterion that generating units or aggregated plants are obligated to adhere to. 5. In R2, What is the technical justification of 5 minutes? Inclusion of arbitrary times in NERC standards must be avoided. Monitoring compliance against an arbitrarily time is usually a meaningless exercise and time consuming effort. In the event of a mishap, the investigation team will determine the appropriateness and timeliness of the operator's actions. Further, the 5 minutes would be insufficient to implement and report a schedule change for generation facilities that are remotely controlled and reactive power is ramped via SCADA controls. Facilities such as these may not be able to comply within 5 minutes. A 10 minute requirement would seem more appropriate. 6. R3.2 and 3.1 should be combined. This could be easily accomplished by removing the word "generator" from 3.1 and removing all of 3.2 7. One reactive element we do not see in this standard is the need to communicate any changes in reactive capability of a resource (its output may not change but auxillary equipment may restrict full capability). 8. R4 and R5 and all their sub-requirements do not belong in a standard for maintaining network voltage schedules. It, like the similar statements in VAR-001 belong in a planning type standard and not here 9. M3 measures the same thing as M2. 10. Unsure of how this standard will be evaluated. It contains elements that would suggest that information must be periodically collected but then it appears that the TOP will be evaluated through an Audit. For this standard to go forward it needs to be revised either as a documentation standard or as a routine data collection standard.

Commenter	Comment
	<p>Response:</p> <ol style="list-style-type: none"> 1. The requirement to report power system stabilizers was Requirement 9 from Version 0 and was moved into this standard to keep similar Generator Operator requirements together in a single standard. 2. See the response to your comment on Question 2. 3. In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive 4. VAR-001 R5 indicates the TOP will issue a ‘directive’. This standard (VAR-002) is intended to align with VAR-001. 5. There may be other resources available other than generators, such as capacitors. 3.1 is aimed at generators – and 3.2 is aimed at other devices under the generator operator’s control. 6. R3.1 and R3.2 were modified to add ‘and capability’ to address your concern. 7. While these requirements could be moved to another standard, there is nothing ‘wrong’ with them being included in this standard. 8. These are measuring two different things. The standard was modified to add the specific references to the requirements to make this more clear. 9. The measures identify what will be used to assess compliance. There is a measure and associated levels of non-compliance for each requirement. Self-certification and audits are identified in the standard as methods that may be used to assess compliance. Please be more specific in identifying which requirement you believe cannot be evaluated.
<p>Allegheny Power (1) William J. Smith</p>	<p>The Purpose section states that the purpose of this standard is 'To ensure generators provide reactive... within applicable Facility Ratings. Although this is true, this statement either intentionally or unintentionally, through its wording, does not address maintaining voltage levels and or Reactive Power schedules specified by the Transmission Operator.</p>
	<p>Response: Maintaining voltage levels is part of ensuring generators provide reactive and voltage control necessary to ensure voltage levels, reactive flows, and reactive resources are maintained within applicable Facility Ratings to protect equipment and the reliable operation of the Interconnection</p>
<p>U.S. Bureau of Reclamation (4, 5) Deborah M. Linke</p>	<ol style="list-style-type: none"> 2. R1. requires operation with AVR controlling voltage for generators connected to the “interconnected transmission system”. “Interconnected transmission system” is not defined by this standard or in the NERC Glossary. We recommend Bulk Electric System which is defined in the NERC Glossary be used in lieu of “interconnected transmission system”. 3. R2. requires the Generator Operator to provide voltage support as directed by the Transmission Operator within the rating of the facility. This sounds as if the Generator Operator is obligated to provide any and all reactive capability available if directed. This language is in contrast to the situation described in the NERC Functional Model. Per the Functional Model, a prime task of the Generator Operator is to “operate generators to provide energy or Interconnected Operations Services per contracts or arrangements.” Voltage support is one of several Interconnected Operations Services or ancillary services a generator is capable of providing. However, except in

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Commenter	Comment
	<p>emergencies, this support is provided per the conditions of the contract or arrangements. The Generator Operator is obligated to deliver on the contracts or arrangements made with the Transmission Operator.</p> <p>4. R2. should be modified to reflect the Generator Operator’s obligation to provide the ancillary services as prearranged. We recommend changing R2. to read: Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power output (in accordance with contracts or arrangements) as directed by the transmission operator. We believe it is implied that the Generator Operator will not enter into agreements or contracts to provide ancillary services outside the applicable rating of the facility; the Generator Operator is the entity responsible for the safe and reliable operation of the facility.</p> <p>5. R3.1 requires the Generator Operator to notify the Transmission Operator of a change in status of the voltage regulator or power system stabilizer. Since this standard does not include the requirement for a power system stabilizer the notification of its status seems out of place in this standard. We suggest all references to power system stabilizer be removed from this standard.</p>
<p>Response:</p>	<p>1. Making this change would make the wording, in this case, a bit cumbersome. The Bulk Electric System is all encompassing- and it is difficult to interconnect with something that already includes every device.</p> <p>2. Many aspects of the functional model have yet to be realized. Its mostly IPPs that have contracts with TOPs.</p> <p>3. NERC’s reliability standards are reliability-related and aren’t dependent upon the terms of contracts or agreements</p> <p>4. This is a requirement that was in the Version 0 VAR-001 and was moved, unchanged, into VAR-002 solely to keep all the generator’s requirements together in a single standard rather than subdivided over the two standards.</p>
<p>Southern Co. Transm. 1) Marc M. Butts Jim Busbin Keith Calhoun Jim Griffith</p>	<p>Requirements and associated measures in VAR-001 (R5) and VAR-002 (R2) should be coordinated to allow for an occasional notification by the TOP to the GOP that a voltage schedule is not being met, that does not require extensive documentation by either entity. In many cases the deviation from schedule is a result of incomplete or inaccurate voltage readings available to the Generator Operator from the (high-side) transmission bus. In other cases, the deviation may not be any cause for concern (see comments in response to Question 1). For these standards to become more effective, every Generator Operator should be required to have a voltmeter in their plant control room that displays the transmission switchyard bus voltage(s).</p>
<p>Response:</p>	<p>The requirement to make the notification has been removed from VAR-001. Adding equipment installation requirements goes beyond the scope of the SARs associated with the work assigned to this drafting team.</p>
<p>Allegheny Energy Supply (5) Carol L. Krysevig</p>	<p>Requirement R2 was modified to include a confusing footnote. If at least one example was given of how the capability could change due to manual control, it may make the footnote worthwhile. As it now stands, it raises more issues than it settles.</p> <p>Requirement R2.2 sets a 5 minute time limit for a response, and in a perfect world when dealing with only one unit it may be adequate. However, in a multiple unit plant under normal workload an operator may be hard pressed to identify and report a problem within 5 minutes. A minimum response time of 10 minutes should be set.</p>

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Commenter	Comment
	<p>Each listed Measure requires "evidence", has "evidence" been defined anywhere? Would documentation of a telephone communication in the Operator's log be considered adequate evidence or will some other format be required?</p>
	<p>Response: The footnote warns that Facility Ratings may be decreased when in manual control. In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive. Evidence has deliberately been left undefined so that each entity can use whatever evidence it has from its existing processes to show that it is compliant. The intent is to avoid mandating that entities change existing practices that support reliability, merely to simplify the compliance measurement process. In the example you cited, the operator's log or a voice recording could provide evidence of information exchange.</p>
<p>NERC Standards Evaluation Subcommittee Bill Bojorquez – ERCOT</p>	<ol style="list-style-type: none"> 2. The SES recommends the SDT change the notification requirement in R3 (M4 and subsequent Levels of Non-Compliance) for Generating Operators to notify its Transmission Operator regarding changes in the status of the generating unit's reactive capabilities to allow each Region to set its own notification (time) requirement, but in no instances should the time limit exceed 30 minutes. 3. R3.2: The SES recommends this Requirement be revised to read: "Any change on any Reactive Power resource under the Generator Operator's control and the expected duration of the change." The SES is also concerned that in a cursory review of the existing Version 0 and Phase III/IV standards, we found no requirement that Generator Operators are to keep others informed of a change in any status which has the effect of limiting the generating units overall capability and operational status. We recognize that VAR-002 is proposed to deal with a generating unit's voltage and reactive capability; so therefore, we welcome any thoughts of the SDT on this. We believe this proposed change to R3.2 begins to address our concern. 4. R5.1: The GO should provide "written" technical justification as to why the GO can not comply with the TOP's transformer tap specifications. 5. M2 & M3: M2 and M3 appear to be somewhat identical in requirement. The SES recommends that M2 and M3 be combined into a single measure M2, thereby allowing the deletion of M3, and the renumbering of the remaining Measurements.
	<p>Response:</p> <ol style="list-style-type: none"> 1. A region can establish a shorter notification requirement if it wants, as long as the requirement is within 30 minutes. You haven't provided any justification for moving this out of the realm of requirements controlled by NERC. 2. Please review the modifications made to R3. Note that adding more requirements for additional notifications goes beyond the scope of the Phase III & IV measures assigned to this drafting team. 3. No justification has been provided for requiring that the notification be provided in writing. 4. These are measuring two different things. The standard was modified to add the specific references to the requirements to make this more clear.

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Commenter	Comment
<p>Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg</p>	<p>2. VAR-002, R2.2; '5 min' time requirement for the Generator Operator to comply with the Transmission Operator's directive doesn't appear to be reasonably achievable. Depending upon what might be transpiring concurrently in the plant, e.g., nuclear events, the Generator Operator may not be able to comply with a 5 minute requirement. 10 minutes might be minimally achievable and Generator Operators would prefer 20-30 minutes.</p> <p>3. In R4.1, M5, C 3.1.2 & C 3.1.3; Delete 'auxiliary transformers'. The reason is that it is the responsibility of the power plant to ensure adequate downstream voltages from equipment supplied from auxiliary transformers. Auxiliary transformers are generally a load on the system and the Transmission Operators should not have to know about its tap settings, impedance, etc.</p> <p>4. M1; If the Voltage Regulator fails, requiring the Generator Operator to obtain approval from the Transmission Operator appears redundant. It may be more appropriate to require the Generator Operator to maintain evidence that it notified the Transmission Operator when the Voltage Regulator fails or malfunctions. M1; Delete 'approval' and substitute 'acknowledgement'.</p> <p>5. M2; Since most plants only have strip chart recorders that are very inaccurate, it would difficult for all plants to have 'sufficiently accurate evidence' that the voltage schedule was met. The compliance monitor should consider instrument accuracy in evaluating compliance.</p>
<p>Response:</p> <p>1. In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive</p> <p>2. The data on auxiliary transformers is used in modeling and analyses.</p> <p>3. This was changed so that approval was replaced with 'notified'</p> <p>4. Its up to each entity to determine how it will show that it is compliant.</p>	
<p>American Transm. Co LLC (1) Jason Shaver</p>	<p>ATC has requested that Requirement 5.1 be removed from the VAR-001. Please see comment in questions 1. In reference to requirement 5.1 could the SDT provide some insight on why a similar requirement was not required of the Generator Operator?</p>
<p>Response: 5.1 was deleted from the revised standard. The requirement was assigned to the TOP because the TOP has better devices to monitor real-time voltage.</p>	
<p>Independent Electricity System Operator (2) Ron Falsetti</p>	<p>2. Ref. our general Comment and comment (ii) on Question 2, above, if the requirement to report power system stabilizer status is removed from VAR-001, then R3.1 in VAR-002 would need to be revised accordingly.</p> <p>3. Also reference Comment (iv) to Question 2, above.</p> <p>4. R3.2 and 3.1 should be combined. This could be easily accomplished by removing the word "generator" from 3.1 and removing all of 3.2</p> <p>5. One reactive element we do not see in this standard is the need to communicate any changes in reactive capability of a resource (its output may not change but auxiliary equipment may restrict full capability).</p>

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Commenter	Comment
	6. M3 measures the same thing as M2.
Response:	
<p>Midwest Reliability Org. (2) Jim Maenner Al Boesch – NPPD (2) Terry Bilke – MISO (2) Bob Coish – MHEB (2) Dennis Florom – LES (2) Ken Goldsmith – ALT (2) Todd Gosnell – OPPD (2) W. Guttormson – SPC (2) Tom Mielnik – MEC (2) Darrick Moe – WAPA (2) P. Oreschnick – XEL (2) Dick Pursley – GRE (2) Dave Rudolph – BEPC (2) Joe Knight – MRO (2) 27 additional MRO members not listed above.</p>	<p>There is inconsistency between R5 and R5.1. R5 refers to the Generator Owner and R5.1 refers to the Generator Operator, the requirements should refer to the same entity.</p>
<p>Response: These are intended to apply to two different entities. The Generator Owner is responsible for the equipment and the Generator Operator would make any notifications of real-time changes.</p>	
Entergy Services, Inc.	2. R2 contains conflicting requirements for the GO. One requirement is that the GO maintain voltage as directed by the TO. The other requirement is that the GO maintain voltage within applicable Facility Ratings. (Why is Facility

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Commenter	Comment
<p>(1) Ed Davis</p>	<p>Ratings capitalized?) We suggest the Facility Ratings requirement be deleted.</p> <p>3. As stated, we believe this requirement is not measureable. However with the suggested changes to VAR-001 R5, above, we think this requirement is measureable.</p> <p>4. R3.1 contains a requirement that the GO notify the TO of a status change of the *power system stabilizers*. Please delete *power system stabilizers* from this voltage and reactive control standard. It is inappropriate to have a requirement not associated with voltage or reactive control in this standard.</p> <p>5. There should be measures for each requirement and those measures should reflect the requirement. There should also be Levels of Non-Compliance for each requirement. Please add measures and Levels of Non-Compliance for each requirement.</p>
<p>Response:</p> <p>1. If the Generator Operator can't meet the schedule – such as if the schedule would cause the Generator Operator to exceed a Facility Rating, then the Generator Operator is required to notify the TOP. This isn't a conflict. Facility Ratings is a defined term, thus it is capitalized.</p> <p>2. In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive</p> <p>3. R3 is a Version 0 requirement that was in VAR-001 and was moved into VAR-002 to keep all the related Generator Operator requirements together in one standard.</p> <p>4. The standard was revised so there is a measure and non-compliance for each requirement.</p>	
<p>American Electric Power (1) James H. Sorrels, Jr.</p>	<p>It would be helpful to clarify the conditions where AVR is out of service, such as unavailable due to failure.</p>
<p>Response: For the purpose of this standard, the Transmission Operator only needs to know that it is out of service with an indication of how long this will last. The TOP needs this information for its real-time analyses and assessments.</p>	
<p>WECC Reliability Subc. Scott Waples – Avista Mohan Kondragunta – SCE Baj Agrawal – APS Michael Sidiropoulos – PAC Chuck Matthews – BPAT Rebecca Berdahl –</p>	<p>There should be a clarification stated in R2.2 whether this applies to normal or contingency situations. If this standard is referring to normal conditions at the generating plant, the time limitations seem reasonable. If the generating plant is experiencing additional problems at the time of the request, additional time should be allowed.</p>

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Comment
BPAP Ben Morris – PG&E Leonard York – WAPA John Leland – NEW Chris Reese – PSE Don DeBerry – SMUD Steve Rueckert – WECC	
	<p>Response: In response to the many commenters who disagreed with the 5 minute response time, the drafting team omitted the time component in the requirement. The requirement now states that the directive must be followed – if the TOP needs a directive to be followed in a specific time period, the TOP can include the time constraint in its directive</p>

6. Do you agree with the stakeholders who recommended the deletion of VAR-003 (Assessment of Reactive Power Resources) because VAR-003 duplicates requirements in the already approved TPL-001 and TPL-002 standards?

Summary Consideration: Most commenters agreed that VAR-003 is duplicated, at least to some degree, in the already approved TPL sequence of standards. There is another drafting team that is working on improving TPL-001 through TPL-004 and the Phase III & IV drafting team will forward these comments to that drafting team with a suggestion that additional details be added to ensure that there is a specific requirement addressing what had been in R1 of VAR-003: The Transmission Planner and Planning Authority shall each establish a method and criteria for assessing adequate static and dynamic Reactive Power requirements.

Commenter	Yes	No	Comment
SERC EC Planning Standards Subcommittee Kham Vongkhamchanh Robert V. McGarrah – Ameren Brian Moss – Duke Phil Kleckley – SCE&G Art Brown – SCPSA Pat Huntley – SERC Bob Jones – SOCO Old Dominion Electric Cooperative (5) Mark Ringhausen		✓	As currently written TPL-001 and TPL-002 do not cover requirement R1 in VAR-003. If the requirements in TPL-001 and TPL-002 were expanded to include R1 of VAR-003, we would then agree with deleting VAR-003.
Response: The drafting team adopted your suggestion.			
U.S. Bureau of Reclamation (4, 5) Deborah M. Linke		✓	We believe this standard should be retained. Standards TPL-001 and TPL-002 do not address an in-depth assessment of reactive resources or available margin and we believe this assessment is very important to support reliability. To harmonize this standard with VAR-001-1 we recommend that it apply to the Transmission Operator rather than the Transmission Planner. Per VAR-001-1 the Transmission Operator is responsible for acquiring sufficient reactive resources; it follows that the Transmission Operator must employ some method to assess the adequacy of resources and determine that an adequate margin exists.
Response: The measure assigned to this drafting team was intended to be assigned to the Transmission Planner and was not intended for real-time application.			

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Yes	No	Comment
Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg		✓	TPL-001 & 2 do not sufficiently cover R1 in VAR-003. Inclusion of R1 of VAR-003 in TPL-001 & 2 would correct the existing gap and in that case, VAR-003 could be deleted.
Response: The drafting team adopted your suggestion.			
American Transm. Co LLC (1) Jason Shaver		✓	ATC does not agree with our fellow stakeholders that VAR-003 is covered in TPL-001, TPL-002 and TPL-003. VAR-003 requires that a Transmission Planner and Planning Authority establish a method and criteria for assessing adequate static and dynamic Reactive Power requirements. TPL-001 thru 003 only states that the two entities include Reactive Power resources to ensure that adequate reactive resources are available to meet system performance. TPL-001 thru 003 lacks the clarity to require a Transmission Planner and Planning Authority to create a method and criteria in both static and dynamic studies to assess adequate reactive resources. VAR-003 provides this clarity to TPL-001 thru 003. ATC requests that the SDT keep VAR-003 and if concerned about its likelihood of passage separate the three standards into two ballots. First ballot would be for VAR-001 and VAR-002. Second ballot would be for VAR-003. VAR-003 has many positive attributes that should not be lost because a handful of stakeholders have asked that it be drop because of a perceived duplication. ATC request that the SDT allow VAR-003 to be balloted on by all entities before a premature removal.
Response: Most commenters indicated a preference for removing VAR-003 as a separate standard. The drafting team was asked to consider having R1 from VAR-003 addressed as part of a revision to the TPL series of standards, and the Phase III & IV drafting team has agreed to do that. There is a team currently working on revisions to TPL-001 through TPL-004.			
Pepco Holdings, Inc.–Affil. (1) Richard Kafka Evan Sage Alvin Depew Carl Kinsley – Delmarva	✓		VAR-003 duplicates requirements already approved in TPL-001 and TPL-002 and therefore, VAR-003 should be deleted.
Response: Most commenters agreed with you, however there were some commenters who felt that VAR-001 R1 should be addressed more			

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Yes	No	Comment
<p>specifically in the TPL series of standards, and the Phase III & IV drafting team has asked the Transmission Plans Standard Drafting Team to review the comments submitted on VAR-003 and consider adding the content of VAR-003 R1 to the revised TPL standards.</p>			
<p>FRCC (2) Linda Campbell – FRCC Dave Darden – Tampa Elec. John Shaffer – FPL Bob Schoneck – FPL</p> <p>Florida Power & Light (1) John W. Shaffer</p>	✓		<p>VAR-003 is not needed because it duplicates requirements in TPL-001 and TPL-002.</p>
<p>Response: Most commenters agreed with you, however there were some commenters who felt that VAR-001 R1 should be addressed more specifically in the TPL series of standards, and the Phase III & IV drafting team has asked the Transmission Plans Standard Drafting Team to review the comments submitted on VAR-003 and consider adding the content of VAR-003 R1 to the revised TPL standards.</p>			
<p>Independent Electricity System Operator (2) Ron Falsetti</p>	✓		<p>(i) We generally agree with the deletion of VAR-003. However, while the general intent of the requirements in VAR-003 is covered by TPL-001 and TPL-002, specific requirements are not fully duplicated in these two latter standards. We suggest that the specific VAR-003 requirements be put in a place-holder for consideration in future review of TPL-001 and TPL-002.</p>
<p>Response: Most commenters agreed with you, and the Phase III & IV drafting team has asked the Transmission Plans Standard Drafting Team to review the comments submitted on VAR-003 and consider adding the content of VAR-003 R1 to the revised TPL standards.</p>			
<p>NERC Standards Evaluation Subcommittee Bill Bojorquez – ERCOT</p>	✓		<p>The SES agrees that VAR-003 duplicates requirements already approved in TPL-001 and TPL-002 and therefore, VAR-003 should be deleted.</p>
<p>Response: Most commenters agreed with you, however there were some commenters who felt that VAR-001 R1 should be addressed more specifically in the TPL series of standards, and the Phase III & IV drafting team has asked the Transmission Plans Standard Drafting Team to review the comments submitted on VAR-003 and consider adding the content of VAR-003 R1 to the revised TPL standards.</p>			
<p>NYISO (2) Michael C. Calimano</p>	✓		
<p>Dynegy (5) Greg Mason</p>	✓		
<p>Tampa Electric Co. (1) Dave Darden</p>	✓		
<p>Allegheny Power (1)</p>	✓		

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Yes	No	Comment
William J. Smith			
Southern Co. Gen. (6) Roman Carter Tom Higgins Terry Crawley – Nuclear Joel Dison	✓		
Southern Co. Transm. 1) Marc M. Butts Jim Busbin Keith Calhoun Jim Griffith	✓		
Midwest Reliability Org. (2) Jim Maenner Al Boesch – NPPD (2) Terry Bilke – MISO (2) Bob Coish – MHEB (2) Dennis Florom – LES (2) Ken Goldsmith – ALT (2) Todd Gosnell – OPPD (2) W. Guttormson – SPC (2) Tom Mielnik – MEC (2) Darrick Moe – WAPA (2) P. Oreschnick – XEL (2) Dick Pursley – GRE (2) Dave Rudolph – BEPC (2) Joe Knight – MRO (2) 27 additional MRO members not listed above.	✓		
Entergy Services, Inc. (1) Ed Davis	✓		
American Electric Power (1) James H. Sorrels, Jr.	✓		

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Yes	No	Comment
WECC Reliability Subc. Scott Waples – Avista Mohan Kondragunta – SCE Baj Agrawal – APS Michael Sidiropoulos – PAC Chuck Matthews – BPAT Rebecca Berdahl – BPAP Ben Morris – PG&E Leonard York – WAPA John Leland – NEW Chris Reese – PSE Don DeBerry – SMUD Steve Rueckert – WECC	✓		

7. Please provide any other comments on this set of standards (VAR-001, VAR-002, and VAR-003) that you haven't already provided.

Commenter	Comment
FRCC (2) Linda Campbell – FRCC Dave Darden – Tampa Elec. John Shaffer – FPL Bob Schoneck – FPL Florida Power & Light (1) John W. Shaffer	After the requirements of VAR-001 are reviewed and modified, VAR-001 should be re-submitted for industry comments.
<p>Response: The drafting team does not think that the changes made to the standards were significant enough to warrant an additional comment period.</p>	
NYISO (2) Michael C. Calimano	These Standards need to include not only voltage schedules and reactive power schedules but also include the voltage control mode which uses voltage ranges and reactive ranges, and not specific voltage schedules.
<p>Response: This goes beyond the scope of the SARs assigned to the drafting team.</p>	
ISO/RTO Council (2) Charles Yeung – SPP Al DiCaprio – PJM Sam Jones – ERCOT Ron Falsetti – IESO Peter Brandien – ISO-NE Bill Phillips – MISO Mike Calimano – NYISO Lisa Szot – CASSO Independent Electricity System Operator (2) Ron Falsetti	(i) These Standards need to include not only voltage schedules and reactive power schedules but also include the voltage control mode which uses voltage ranges and not specific voltage schedules. (ii) Remove words such as "sufficient"
<p>Response: The suggestion goes beyond the scope of the SARs assigned to this drafting team. The word, 'sufficient' appears in requirements that were developed during Version 0, and modifying these requirements is outside the scope of the drafting team.</p>	

Consideration of Comments on Draft 3 of Phase III & IV – VAR-001, VAR-002, VAR-003

Commenter	Comment
Tenn. Valley Authority (1) Walter E. Joly Charles Feagans Jennifer Weber Mark Marcum David Thompson Jerry Nicely Dennis Chastain James Regg	Generally, there appears to be an inordinate burden of responsibility for maintaining Voltage & Reactive Schedule on the Transmission Operators rather than the Generator Operators. VAR-001 & VAR-002 appear to need additional consideration and review prior to balloting.
<p>Response: The Transmission Operator has responsibility for controlling voltage within its area and that is reflected in the draft standards.</p>	
Pepco Holdings, Inc.–Affil. (1) Richard Kafka Evan Sage Alvin Depew Carl Kinsley – Delmarva	It is disappointing that it is beyond the scope of the SAR to change the measures for these standards. They are essentially Version 0 with version 1 labels.
<p>Response: There is another drafting team in place that is adding measures and compliance elements to all of the Version 0 standards that were incomplete when approved.</p>	
Entergy Services, Inc. (1) Ed Davis	Please provide a redline of VAR-001-1 to the existing VAR-001-0.
<p>Response: The drafting team will do this with its next posting.</p>	
American Electric Power (1) James H. Sorrels, Jr.	These standards are still inadequate, as previous comments from multiple commenters have indicated. However, any attempt to make the necessary changes have always been met by statements that "modifying the requirements for the existing Version 0 standards is outside the scope of the SARs assigned to this drafting team." It is apparent a new SAR is needed to address the short-comings of these proposed standards/requirements and to put boundaries around the concept of "reactive reserves." Some areas deserving further examination: What constitutes "sufficient reactive resources" in VAR-001 R2? Development of a "reactive reserve" requirement and would this be on a load center basis or some other basis. Development of reactive reserve monitoring requirements. Incorporating a day ahead review of one's reactive position as part of the operations planning requirements and tying it to planning for and acquiring reactive reserve margins for the next day's projected conditions.
<p>Response: There is another drafting team in place that is adding measures and compliance elements to all of the Version 0 standards that were incomplete when approved.</p>	

Commenter	Comment
	<p>R2 is a Version 0 requirement and is outside the scope of this drafting team. You can request an interpretation to the standard by following the process outlined in the Reliability Standards Development Process.</p>