NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments on First Posting of SAR for Project 2008-01 — Voltage and Reactive Planning and Control

The Voltage and Reactive Planning and Control SAR Drafting Team (VRPC SAR DT) thanks all commenters who submitted comments on the proposed SAR. The SAR was posted for a 30-day public comment period from August 17, 2009 through September 16, 2009. Stakeholders were asked to provide feedback on the standards through a special electronic comment form. There were 27 sets of comments, including comments from more than 75 different people from over 30 companies representing 7 of the 10 Industry Segments as shown in the table on the following pages.

http://www.nerc.com/filez/standards/Project2008-01_Voltage_and_Reactive_Planning_and_Control.html

Summary Consideration: Stakeholders had some general concerns about the SAR and the VRPC SAR DT made conforming revisions, resulting in significant edits to the SAR. The VRPC SAR DT believes that these conforming revisions did not change the original intent of the SAR, but clarified the language to address stakeholder concerns. A few stakeholders made suggestions more suited to the standard development process. The VRPC SAR DT will forward these comments to the standard drafting team for their consideration.

Stakeholders generally agreed that there is a reliability need for the proposed standards action. Many stakeholders agreed with the scope of the SAR, however most commenters expressed some concerns with specific parts of the SAR. Most stakeholders agree that the proposed standards action addresses the relevant FERC Order 693 directives. One stakeholder indicated that the manner in which the ERO, via the SAR and white paper, attempts to address the directives is not clear. We have redrafted the SAR to remove prescriptive language and allow the standard drafting team to address the FERC Order 693 directives.

Several stakeholders were concerned about language in the SAR that they perceived as being prescriptive and that the SAR DT had made too many decisions that should be left to the standard drafting team. To address these concerns, the SAR has been revised to remove what was perceived as prescriptive language.

- References to the Year #5 plan requirement were removed from the SAR.
- The VRPC SAR DT removed references to the budgeting process from the SAR.
- Language regarding the whitepaper has been softened to indicate that it is a reference document for this SAR. The whitepaper is a reference document to be considered (rather than “reflected” per the original SAR language) in developing the standards.
- The intent of the SAR has been clarified by removing the “how to” examples from the body of the SAR. These examples are contained in the whitepaper as examples of how Voltage and Reactive Planning and Control *could* be implemented.
- The concept of Reactive Power Conservation Plan topic was edited in the SAR to be less prescriptive to allow the standard drafting team flexibility.
- We have removed the Transmission Planning Reactive Cluster (TPRC) terminology from the SAR. However, coordination is still required among neighboring Planning Coordinators/Transmission Planners (PCs/TPs) and other functional entities within their footprint.

- Elements from FERC order 693 have been incorporated into the SAR while the whitepaper is provided as a reference document to be considered in the development of standards.
- Some concerns were expressed that duplicate requirements (that may already exist in other standards) may be developed within the VAR standards. To address this concern, we have added the TPL standards as standards which may be revised under this SAR. The future VRPC Standard Drafting Team (SDT), using the public comment process, will determine the technical details of the VAR Standard requirements, and will also make recommendations to change unclear or implicit requirements in other existing Standards such as MOD, FAC, TPL, TOP and EOP.
- One comment addresses the need for coordination of reactive power requirements / voltage schedules between neighboring systems. We have revised the SAR to include a coordination process (see "Detailed Description"):

  > In addition to establishing reactive planning criteria, the standards should require a reactive power support and control plan ('VAR Plan'). Neighboring PCs/TPs should review and coordinate plans developed by the functional entities involved. This includes functional entity local plans for reactive power support and control to maintain local system reliability and avoid permanent damage to equipment. . . . The standard should include a requirement for peer review of the VAR Plans and their associated criteria. This review cycle should continue on an annual basis.

- The standard operations planning procedures should consider including a requirement for the Transmission Operator (TOP) and Reliability Coordinator (RC) to monitor and take action if reactive power or voltage falls outside identified limits.

Most stakeholders agreed with the applicability of the SAR with a few exceptions.

- The Resource Planner and Market Operator were removed as applicable entities based on stakeholder comments and the Balancing Authority was added.
- Some stakeholders questioned having the Purchasing-Selling Entity and Load-Serving Entity as applicable entities. These entities are explicitly listed in FERC Order 693 directives. In order to address these directives fully, these entities must be listed as possible applicable entities.

The majority of stakeholders did not identify any regional variances or business practices. One stakeholder suggested that a summer peak region and a winter peak region should have different var planning strategy to better fit its unique system condition. The revised SAR states:

> Reactive power needs vary significantly based on system characteristics, and because reactive power needs to be supplied locally, it may not be appropriate to establish a continent-wide reactive reserve requirement.

Another stakeholder suggested that variations in voltage schedules/levels should be considered in the SAR. The VRPC SAR DT believes that neighboring PCs/TPs will need to coordinate to take this into account. The revised SAR states:

> The neighboring PCs/TPs and their associated functional entities must establish appropriate criteria for the area under consideration. Such areas may have differing detailed criteria and requirements for static and dynamic reactive support, based on the area's characteristics.

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 Adamski, at 609-452-8060 or at gerry.adamski@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.[1]

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

Index to Questions, Comments, and Responses

The Industry Segments are:

1 — Transmission Owners
2 — RTOs, ISOs
3 — Load-serving Entities
4 — Transmission-dependent Utilities
5 — Electric Generators
6 — Electricity Brokers, Aggregators, and Marketers
7 — Large Electricity End Users
8 — Small Electricity End Users
9 — Federal, State, Provincial Regulatory or other Government Entities
10 — Regional Reliability Organizations, Regional Entities

		Commenter	Organization	Industry Segment									
				1	2	3	4	5	6	7	8	9	10
1.	Group	Guy Zito	Northeast Power Coordinating Council										X

	Additional Member	Additional Organization	Region	Segment Selection
1.	Ralph Rufrano	New York Power Authority	NPCC	5
2.	Alan Adamson	New York State Reliability Council	NPCC	10
3.	Gregory Campoli	New York Independent System Operator	NPCC	2
4.	Roger Champagne	Hydro-Quebec TransEnergie	NPCC	2
5.	Kurtis Chong	Independent Electricity System Operator	NPCC	2
6.	Sylvain Clermont	Hydro-Quebec TransEnergie	NPCC	1
7.	Manuel Couto	National Grid	NPCC	1
8.	Chris de Graffenried	Consolidated Edison Co. of New York, Inc.	NPCC	1
9.	Peter Yost	Consolidated Edison Co. of New York, Inc.	NPCC	3
10.	Mike Garton	Dominion Resources Services, Inc.	NPCC	5
11.	Brian L. Gooder	Ontario Power Generation Incorporated	NPCC	5
12.	Kathleen Goodman	ISO - New England	NPCC	2
13.	David Kiguel	Hydro One Networks Inc.	NPCC	1

	Commenter	Organization	Industry Segment									
			1	2	3	4	5	6	7	8	9	10
14. Michael R. Lombardi	Northeast Utilities	NPCC 1										
15. Randy MacDonald	New Brunswick System Operator	NPCC 2										
16. Greg Mason	Dynegy Generation	NPCC 5										
17. Bruce Metruck	New York Power Authority	NPCC 6										
18. Chris Orzel	FPL Energy/NextEra Energy	NPCC 5										
19. Robert Pellegrini	The United Illuminating Company	NPCC 1										
20. Michael Schiavone	National Grid	NPCC 1										
21. Lee Pedowicz	Norhteast Power Coordinating Council	NPCC 10										
22. Gerry Dunbar	Northeast Power Coordinating Council	NPCC 10										
2. Group	Doug Hohlbaugh	FirstEnergy Corp	X		X	X	X	X				

Additional Member	Additional Organization	Region	Segment Selection
1. David Barber	FirstEnergy Corp		1
2. Sam Ciccone	FirstEnergy Corp		1, 3, 4, 5, 6

3. Group	Carol Gerou	MRO NERC Standards Review Subcommittee										X

Additional Member	Additional Organization	Region	Segment Selection
1. Neal Balu	WPS Corporation	MRO	3, 4, 5, 6
2. Terry Bilke	Midwest ISO Inc.	MRO	2
3. Jodi Jenson	Western Area Power Administration	MRO	1, 6
4. Ken Goldsmith	Alliant Energy	MRO	4
5. Alice Murdock	Xcel Energy	MRO	1, 3, 5, 6
6. Dave Rudolph	Basin Electric Power Cooperative	MRO	1, 3, 5, 6
7. Eric Ruskamp	Lincoln Electric System	MRO	1, 3, 5, 6
8. Joseph Knight	Great River Energy	MRO	1, 3, 5, 6
9. Joe DePoorter	Madison Gas & Electric	MRO	3, 4, 5, 6
10. Scott Nickels	Rochester Public Utilities	MRO	4
11. Terry Harbour	MidAmerican Energy Company	MRO	1, 3, 5, 6

		Commenter	Organization	Industry Segment									
				1	2	3	4	5	6	7	8	9	10
4.	Group	Philip R. Kleckley	SERC Planning Standards Subcommittee	X		X		X					

	Additional Member	Additional Organization	Region	Segment Selection
1.	John Sullivan	Ameren Services Company	SERC	1
2.	Charles Long	Entergy	SERC	1
3.	Scott Goodwin	Midwest Independent System Operator	SERC	1
4.	James Manning	NC Electric Membership Corporation	SERC	3
5.	Jim Kelley	PowerSouth Energy Cooperative	SERC	3
6.	Pat Huntley	SERC Reliability Corporation	SERC	10
7.	Bob Jones	Southern Company Services	SERC	1

5.	Group	Jalal Babik	Electric Market Policy	X		X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Louis Slade		SERC	5
2.	Mike Garton		NPCC	6
3.	Craig Crider	System Planning	SERC	1

6.	Group	Jason L. Marshall	Midwest ISO Standards Collaborators		X								

	Additional Member	Additional Organization	Region	Segment Selection
1.	Bob Thomas	Illinois Municipal Electric Agency	RFC	4
2.	Alice Murdock	Xcel Energy	MRO	1, 3, 6
3.	Joe Knight	Great River Energy	MRO	5, 6, 1, 3

7.	Group	Denise Koehn	Bonneville Power Administration	X		X		X	X				

	Additional Member	Additional Organization	Region	Segment Selection
1.	Fran Halpin	Power Duty Scheduling	WECC	3, 5, 6
2.	Rebecca Berdahl	Power Services Long Term Sales and Purchases	WECC	3, 5, 6
3.	Steve Hitchens	Transmission Technical Operations	WECC	1
4.	Frank Puyleart	Transmission Technical Operations	WECC	1

	Commenter	Organization	Industry Segment									
			1	2	3	4	5	6	7	8	9	10
5. Tedd Snodgrass	Transmission Dispatch Office	WECC 1										
8. Group	Ben Li	IRC Standards Review Committee		X								
Additional Member	**Additional Organization**	**Region**	**Segment Selection**									
1. Matt Goldberg	ISO-NE	NPCC	2									
2. Bill Phillips	MISO	MRO	2									
3. Anita Lee	AESO	WECC	2									
4. Charles Yeung	SPP	SPP	2									
5. Jame Castle	NYISO	NPCC	2									
6. Steve Myers	ERCOT	ERCOT	2									
7. Patrick Brown	PJM	RFC	2									
9. Group	Ken Wofford	Georgia Transmission Corporation and Georgia System Operations	X		X	X						
Additional Member	**Additional Organization**	**Region**	**Segment Selection**									
1. Scott Barfield	GSOC	SERC	3, 4									
10. Individual	Frank Gaffney	Florida Municipal Power Agency, and its Member City, Lakeland Electric	X		X	X	X	X				
11. Individual	Duncan Brown	Calpine Corporation					X					
12. Individual	Hugh Francis	Southern Company	X		X		X					
13. Individual	Kasia Mihalchuk	Manitoba Hydro	X		X		X	X				
14. Individual	Sharma Kolluri	Entergy	X		X		X					X
15. Individual	Michael Ayotte	ITC Holdings	X									
16. Individual	Karl Bryan	US Army Corps of Engineers, Northwestern Division	X				X					

		Commenter	Organization	Industry Segment									
				1	2	3	4	5	6	7	8	9	10
17.	Individual	John E. Sullivan	Ameren	X		X		X	X				
18.	Individual	Thomas J. Bradish	RRI Energy Inc					X	X				
19.	Individual	Baj Agrawal	Arizona Public Service Co.	X		X		X					
20.	Individual	Martin Bauer	US Bureau of Reclamation					X					
21.	Individual	James H. Sorrels, Jr.	American Electric Power (AEP)	X		X		X	X				
22.	Individual	Howard Rulf	We Energies			X	X	X					
23.	Individual	Greg Rowland	Duke Energy	X		X		X	X				
24.	Individual	James Starling	SCE&G	X		X		X	X				
25.	Individual	Jason Shaver	American Transmission Company	X									
26.	Individual	Dan Rochester	Independent Electricity System Operator		X								
27.	Individual	Alice Murdock	Xcel Energy	X		X		X	X				

1. Do you agree that there is a reliability-related need for the proposed standards action? If not, please explain in the comment area.

Summary Consideration: Stakeholders generally agreed that there is a reliability need for the proposed standards action. Several stakeholders expressed concerns with having planning requirements in the VAR standards. The VRPC SAR DT has added the TPL standards as standards that could be revised under this SAR. The revised SAR has removed the reference to the 5 year reactive control plan and also made extensive revisions to remove prescriptive language throughout the SAR. Language regarding the whitepaper has been softened to indicate that it is a reference document for this SAR.

Organization	Yes or No	Question 1 Comment
Bonneville Power Administration (BPA)	No	BPA conducts weekly/daily outage studies for all major paths and flowgates with adjacent BA areas. These studies determine adequate reactive margin to meet voltage stability criteria. Additional standards will not improve upon this process.
Response: The VRPC SAR DT thanks you for your comment. While BPA may conduct the studies you mention, other entities may not. The SAR will address these operating horizon evaluations. In addition to RC/TOP operations planning studies that you note above, PC/TP entities need to provide certain deliverables which coordinate with the RC and other functional entities.		
Ameren	No	Reactive power planning should be incorporated with the TPL standards, rather than be covered by a separate set of standards.
Response: The VRPC SAR DT thanks you for your comment. The revised draft SAR has been edited to address the operating horizon and to address the need to coordinate the planning horizon with the operating horizon. The drafting team noted that a significant number of comments indicated that requirements applicable to the TPL standards should be included in the TPL standards and this SAR will permit the SDT to make recommendations for explicit requirements as needed in the TPL standards. The revised SAR has removed the reference to the 5 year reactive control plan.		
Electric Market Policy	No	There are standards in existence that either already cover most of the proposed concepts or could be modified so that they do. To cite a few; FAC-001, MOD-011, TOP-002 and TPL-001 through 006. We do not agree with the recent phenomena of "realigning" existing standards just to place them in groups of "like" activities or requirements. For example moving R1.3.9 from TPL-002 to VAR-XXX does not add value. There is too much standard revision activity that is not improving on existing standards, merely realigning them, which is detrimental to the standards development processes particularly those standards that urgently need revision in order to insure reliability. We also believe that the TPL requirements will cause capacitors to be placed whenever it is necessary. A new standard would create redundancy and confusion. If the TPL standards say that we need a capacitor at XYZ location to cure a voltage violation, the utility would be required to do so. For this reason, We would propose that, if "gaps" are found in the current standards and requirements related to reactive/voltage

Organization	Yes or No	Question 1 Comment
		planning, monitoring and operating processes, these be addressed, to the extent possible, by modifying existing standards not by realignment or creation of new VAR standards just because someone would like to see all reactive/var requirements in a standard that begins with VAR-???.
Response: The VRPC SAR DT thanks you for your comment. The concern of including all reactive requirements in VAR standards strictly because they are reactive power requirements was discussed by the drafting team. An effort was made to keep the SAR within the operating and operations planning horizon and not expand it into the long term planning horizon. If any realignment is required, the Drafting Team can make recommendations to address these concerns in other standards such as TPL standards. In addition to RC/TOP operations planning studies, PC/TP entities need to provide certain deliverables which coordinate with the RC and other functional entities.		
US Bureau of Reclamation	No	There is no reliability-related need for some of the proposed standard actions. The proposed action includes good planning concepts. Those concepts appear to go well beyond the intent of the need for the modifications as directed by FERC and as detailed in the Reliability Standards Development Plan. While the need for more definitive requirements are needed for long range planning, they are not part of the reliability standards modified under this project. The proposed standards action includes the requirement to develop a five year plan for reactive support. This plan is to include "required" changes to existing control systems among other components. These required changes and the five year plan can be argued are no longer reliability based as they come dangerously close to violating the limitation imposed by the Energy Policy Act of 2005. Generally, grid planning (especially a long term plan) is to identify future needs and encourage resource development. The TPL standards which address long term planning require the assessments are conducted to demonstrate that the "Network can be operated to supply projected customer demands and projected Firm (non- recallable reserved) Transmission Services at all Demand levels over the range of forecast system demands". These standards require the evaluation for the existing and planned facilities. The result of the studies is an assessment of the Network including "planned upgrades for the various planning Categories. These "planned upgrades" are not the same requiring upgrades to existing facilities, rather the changes to the Network that have been planned by the registered entities. The Energy Policy Act specifically addressed the required changes (3) The term “reliability standard” means a requirement, approved by the Commission under this section, to provide for reliable operation of the bulk-power system. The term includes requirements for the operation of existing bulk-power system facilities, including cyber security protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system, but the term does not include any requirement to enlarge such facilities or to construct new transmission capacity or generation capacity.
Response: The VRPC SAR DT thanks you for your comment. We agree the VAR standards should not include any specific requirements to enlarge such facilities or to construct new transmission capacity or generation capacity. The revised SAR satisfies the Energy Policy Act by noting that as deemed appropriate Demand Side Management can and should be used to maintain system reliability, avoid permanent equipment damage to equipment, and avoid an uncontrolled voltage collapse resulting in a wide spread blackout. NERC Standards must address reliability even when new transmission capacity or generation capacity is not provided.		

Organization	Yes or No	Question 1 Comment
Independent Electricity System Operator (IESO)	No	We believe reactive power requirements, defined in terms of magnitude, location, timing and response characteristics, are part of the determined parameters (i.e. outputs) of planning assessments, and are part of SOLs and IROLs that are governed by voltage performance. In planning, the need to reinforce or build new transmission facilities including voltage control/support devices is determined based on projected system conditions including demand forecast in accordance with established planning criteria (or performance targets). In today's industry, Transmission Owners have the obligation to connect, but not necessarily the obligation to build. Transmission Planners assess future needs and Transmission Owners either by market rules or regulations or for profit will provide the needed facilities in accordance with the identified needs. The need to install reactive devices, may they be dynamic or static, and the amount of reactive power support from generators (including their locations) to meet established performance targets (in conjunction with or in lieu of the planned transmission facilities) are identified in the planning assessment. We therefore do not see the need to have a separate standard to stipulate the reactive power requirements. Adding appropriate requirements in the TPL standard, or as a condition in the performance table, would serve this purpose. In operations and operational planning, Transmission Operators and Reliability Coordinators determine SOLs and IROLs. Those SOLs and IROLs that are restricted by voltage performance must therefore require the TOP and RC to not only identify the maximum amount of power flow that ensure acceptable voltage performance, but also specify the voltage bounds (min. and max. as applicable) and the associated reactive support requirements with which the SOLs and IROLs are valid. In other words, reactive power requirements and their locations, where applicable, together with voltage minimum and maximum, are part of an SOL or IROL. The reactive requirements can be stipulated in the form of spare reactive capability of generators or other dynamic devices, amount of switchable reactive devices (both capacitive and reactive) or SVCs, etc. In some areas, such as the IESO Controlled Grid, some SOLs and IROLs are expressed in maximum power flows together with the minimum voltage and the minimum spare reactive capability in specific locations. All these three parameters collectively form SOL/IROL set and system operators must comply with all of them simultaneously to ensure reliability. SOLs and IROLs, in whichever way they are expressed, are the boundary conditions within which power system reliability can be maintained. To ensure that reactive requirements are identified to meet target performance in operations, a requirement to identify such requirements as applicable, stipulated in the SOL/IROL calculation methodology (FAC-010 and FAC-011), would serve the purpose. We believe that by expanding the TPL standard and the FAC standards, the FERC directive that "planning criteria must include detailed and definitive requirements on established limits and sufficient reactive resources and must identify acceptable margins (i.e. voltage and/or reactive power margins) above voltage instability points to prevent voltage instability and to ensure reliable operations" can me met. To be certain, the FAC standards can also include a requirement that the methodology must include acceptable margins for SOLs and IROLs that are restricted by voltage stability.
IRC Standards Review Committee	No	While we agree the existing VAR standards need to be reviewed and improvements could be made, we are concerned that this SAR could lead to an unnecessary and prescriptive standard that focuses on how reactive power and voltage requirements are met rather than simply establishing what reactive power and voltage requirements need to be met. We believe reactive power requirements are part of the determined parameters in planning assessments, and a part of SOL and IROL that are governed by voltage performance. In planning, the need to reinforce or build new transmission facilities

Organization	Yes or No	Question 1 Comment
		including voltage control/support devices is determined based on project system conditions including demand forecast in accordance with established planning criteria (or performance targets). Transmission Planners assess future needs for dynamic or static reactive power support and identified them in the planning assessment process. We therefore do not see the need to have a separate standard to stipulate the reactive power requirements for the planning horizon. Adding a requirement in the TPL standard, or as a condition in the performance table, would serve this purpose. In operations and operational planning, Transmission Operators and Reliability Coordinators determine SOLs and IROLs which include those that are restricted by voltage performance. These SOLs and IROLs may require the TOP and RC to specify the voltage bounds (min. and max. as applicable) and the associated reactive support requirements with which the limits are valid. In other words, reactive power requirements and their locations, where applicable, together with voltage minimum and maximum, are part of an SOL or IROL. The reactive requirements are either stipulated in the form of spare reactive capability of generators or other dynamic devices, amount of switchable reactive devices (both capacitive and reactive) or SVCs, etc. Hence, to ensure that reactive requirements are identified to meet target performance in operations, adding a requirement to identify such reactive requirements in the SOL/IROL calculation methodology standards - FAC-010 and FAC-011, or strengthening the existing requirements in these standards, would serve the purpose.
Response: The VRPC SAR DT thanks you for your comment. Within the scope of the VRPC SAR, the SAR DT expects the future VAR Standard Drafting Team to examine the above technical details and recommend changes to other Standards if appropriate. The VRPC SAR DT has edited the SAR to remove language that is prescriptive. See the revised SAR.		
American Electric Power (AEP)	No	With respect to the existing scope and applicability of the VAR standards, a revisit may be in order to address certain FERC and industry comments. However, this SAR presumes to expand the scope of the VAR standards beyond what is necessary. The subject of voltage control and reactive resources is only one aspect of planning and operations. The SAR's assumption that this aspect needs to be singled out for special treatment lacks justification, when, in fact, the opposite may be true. For example, in order to comply with the existing TPL standards, entities must already have voltage control plans and reactive resources in place. This is particularly true in areas vulnerable to voltage collapse. We are not persuaded, therefore, that gaps or a lack of coordination exists as to "which functional entities should be involved in the analysis, planning and operation of reactive support and control."
Response: The VRPC SAR DT thanks you for your comment. Your concern is noted, and we have edited the SAR to allow the drafting team the flexibility to address the FERC requirements.		
Arizona Public Service Co.	Yes	
Calpine Corporation	Yes	

Organization	Yes or No	Question 1 Comment
Entergy	Yes	
Florida Municipal Power Agency, and its Member City, Lakeland Electric	Yes	
Georgia Transmission Corporation and Georgia System Operations	Yes	
Manitoba Hydro	Yes	
RRI Energy Inc	Yes	
SCE&G	Yes	
Southern Company	Yes	
We Energies	Yes	
Xcel Energy	Yes	
FirstEnergy Corp	Yes	FirstEnergy agrees that improvements could be made to the NERC reliability standards related to reactive power and voltage control. We support the goals of this project and establishing some level of expectation for a split between dynamic and static voltage control.
Response: The VRPC SAR DT thanks you for your comment.		
MRO NERC Standards Review Subcommittee	Yes	MRO NSRS only agrees because BES reliability might be enhanced by suitable improvements to the existing VAR standards. MRO NSRS agrees the VAR standards need to be reviewed and improvements could be made.

Organization	Yes or No	Question 1 Comment
Response: The VRPC SAR DT thanks you for your comment.		
Northeast Power Coordinating Council	Yes	There are currently multiple projects addressing reactive power issues. Project 2006-02 has been tasked with developing reactive power planning criteria for both steady state and voltage stability via TPL standards. Project 2007-09 has been tasked with developing standards to ensure that generators are capable of riding through voltage excursions and ensure that generator models and exciter models accurately reflect the generators capabilities using the PRC and MOD standards. This project is tasked with developing operating and planning protocols necessary to schedule reactive power resources using VAR standards. There is a reliability need to expand the VAR standards, but the SAR DT should be careful to coordinate with other DT's to make sure that there are no duplicate efforts and to verify that an important reactive power reliability issues is not left out of the standards effort.
Response: The VRPC SAR DT thanks you for your comment. The revised VRPC SAR directs the future VAR Standards Drafting Team to coordinate with other projects and Standards, and to make recommendations to change other Standards as deemed appropriate.		
US Army Corps of Engineers, Northwestern Division	Yes	There is a need for the LSE to take responsibility for the reactive power impact that they place on the transmission system. There is also a need for the reactive resources of the power system to be known and for future planning for where reactive resources need to be placed/developed. There is no need for developing reliability standards that require a change to the existing power system, recall that the EPAct of 2005 specifically stated that Reliability Standards were not to be aimed at betterments/improvements to the BES. It appears that the proposed standard is trying to develop a power grid (long term resource development) as opposed to enhance operational reliability in the immediate time frame. Planning results should not end up becoming a BES Reliability Standard requirement.
Response: The VRPC SAR DT thanks you for your comment. A FERC Order 693 directive, included in the SAR, discusses the LSE issue that you note. The SAR does not intend to have BES facilities built because of standard revisions. The standard drafting team will be responsible for specific requirements.		
Duke Energy	Yes	We agree the VAR standards could be improved, but we believe that this SAR is too prescriptive.
Response: The VRPC SAR DT thanks you for your comment. The intent of the SAR was to provide examples of possible methods for implementing requirements. We have revised the SAR to change language that was unduly prescriptive and indicate that the whitepaper is intended as a reference document.		
ITC Holdings	Yes	We agree there is reliability-related need for voltage and reactive power control throughout the Bulk Electric System (BES), but the SAR and white paper only seem to address one aspect of this and that is the reactive power reserve portion (dynamic and static) in the event of voltage collapse. Order 693 directs the ERO to develop a modification to VAR-001-1 that includes detailed and definitive requirements on "established limits", "sufficient reactive resources" and identify

Organization	Yes or No	Question 1 Comment
		"acceptable margins" above voltage instability points. The white paper does not explicitly state what it means to be voltage stable. If the entities are going to be given the goal of voltage stability, then the ERO should clearly state what the objectives of that goal are.
Response: The VRPC SAR DT thanks you for your comment. The referenced whitepaper is a reference document to be considered by the standard drafting team. **The SAR and whitepaper do not imply that dynamic reactive should be a percentage of the overall reactive capacity. The VRPC SAR (and referenced whitepaper Section 6) describes "what" topics must be covered in neighboring PC/TPs "VAR Plan".** **Section 6 does not describe "how" the above must be done. However, Section 8 of the whitepaper (and associated Appendices) does provide examples of "how" this might be done. One of the Sections 8.5.6 does include dynamic reactive power requirements as a percentage of the neighboring reactive demand plus losses. This is only one of many example methods. Other examples are provided in the associated Section 8 Appendices. The draft VRPC SAR does not prescribe "how" it should be done.** **The white paper was not written to provide a definition for voltage stability. It is expected that the standard(s) written to address this SAR will address what is intended, whether this includes "voltage stability" or "Bulk Electric System reliability".**		
SERC Planning Standards Subcommittee	Yes	We believe it is important to better integrate reactive power planning with the existing processes that address the requirements of the TPL standards.
Response: The VRPC SAR DT thanks you for your comment. We have revised SAR to include potential development of requirements that fit into the TPL standards.		
American Transmission Company	Yes	We only agree because BES reliability might be enhanced by suitable improvements to the existing VAR standards. There have not been many events of unreliable BES voltage levels and voltage instability.
Response: The VRPC SAR DT thanks you for your comment. See the revised SAR.		
Midwest ISO Standards Collaborators	Yes	While we agree the VAR standards need to be reviewed and improvements could be made, we are concerned that this SAR could lead to a prescriptive standard that focuses on how reactive power and voltage requirements are met rather than simply establishing what reactive power and voltage requirements need to be met.
Response: The VRPC SAR DT thanks you for your comment. We have revised SAR to change language that was unduly prescriptive.		

2. Do you agree with the scope of the proposed standards action? If not, please explain in the comment area.

Summary Consideration: Many stakeholders agreed with the scope of the SAR, however most commenters expressed some concerns with specific parts of the SAR. Several stakeholders believed that the SAR was too prescriptive, specifically with the examples listed in the whitepaper. In order to address these concerns, language concerning the whitepaper was changed to indicate that the new or revised requirements would "consider" the whitepaper rather than "reflect' the whitepaper. Other stakeholders expressed concerns regarding planning requirements. We have revised the SAR to include potential development of requirements that fit into the TPL standards. We have also revised the SAR to remove prescriptive language that might be construed as favoring one approach over another. The concept of a Reactive Power Conservation Plan was edited in the SAR to be less prescriptive to allow the standard drafting team flexibility. The revised SAR has also removed the references to "Clusters" and the 5 year planning horizon.

Organization	Yes or No	Question 2 Comment
FirstEnergy Corp	No	Although we support the project, we encourage the team to view the White Paper as a reference tool in developing the standard and not begin the project with a predetermined goal of standardizing the contents of the White Paper. For example, in the SAR's Brief Description section it is stated that "The existing VAR standards will be modified to address the FERC directives in Order 693, and to reflect the Transmission Issues Subcommittee's "Reactive Support & Control Whitepaper" dated 05/18/2009, " We suggest that the word "reflect" be replaced with "consider". This subtle change will ensure flexibility is given to the standard drafting team in arriving at the appropriate level of detail for a NERC reliability standard. The White Paper is prescriptive and should not be translated into a prescriptive standard that overreaches into the "how" rather than the "what". As an example, the SAR proposes to establish dynamic reactive power requirements and along with the white paper implies this should be a percentage of the overall reactive capability. There are other equally effective ways to ensure there is sufficient dynamic reactive power capability on-line that do not involve setting a percentage threshold. Establishing a voltage drop or deviation threshold following a contingency is one example that will allow an entity to manage dynamic reactive power without setting a direct threshold. The standard should not be so prescriptive that it prevents an entity from meeting the reliability objective of guarding against voltage collapse with alternative approaches.
Response: The VRPC SAR DT thanks you for your comment. We changed "reflect" to "consider" with respect to the whitepaper.		
Ameren	No	Long-term reactive planning should be incorporated into the TPL standards.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to include potential development of requirements that fit into the TPL standards.		

Organization	Yes or No	Question 2 Comment
IRC Standards Review Committee	No	Notwithstanding the above disagreement to develop a new standard, the scope of the SAR and associated white paper could cause the standards drafting team to focus their efforts on developing a prescriptive standard that focuses on "how" rather than "what". As an example, the SAR proposes to establish dynamic reactive power requirements and along with the white paper implies this should be a percentage of the overall reactive capability. There are other equally or more effective ways to ensure there is sufficient dynamic reactive power capability on-line that do not involve setting a percentage threshold. Establishing a voltage drop or deviation threshold following a contingency is one example that will allow an entity to manage dynamic reactive power without setting a direct threshold. The standard should not be so prescriptive that it prevents an entity from meeting the requirements in this manner.
Response: The VRPC SAR DT thanks you for your comment. We changed "reflect" to "consider" with respect to the whitepaper. We have revised the SAR to change language that was unduly prescriptive throughout the SAR.		
Georgia Transmission Corporation and Georgia System Operations	No	Planning criteria ensuring that voltage instability will not occur under all emergency conditions is too much, and in most cases, unnecessary to be verified. Something like the WECC example of selecting "several contingencies judged to be most severe" might be usable.
Response: The VRPC SAR DT thanks you for your comment. If taken literally "……under all emergency conditions" could mean extreme emergency conditions which are not planned events in existing or proposed Standards. The VRPC SAR DT does not believe that is the intended interpretation. The VRPC SAR DT interprets this to mean all planned events as stated in the context of the existing TPL Standards Table 1 and the proposed TPL Standards clarification of planned events P1 to P7 Extreme events are beyond the scope of the VRPC SAR.		
Manitoba Hydro	No	Scope looks very broad. Manitoba Hydro believes the VAR standard should focus on reactive power issues in the real-time operational time frame and the TPL standards should focus on planning for adequate reactive power in the planning horizon. In the White paper, WECC has given an example of a transient voltage dip criteria for dynamic reactive power planning. The MRO has done the same thing (TPL-503-MRO-02). The regions should establish appropriate transient voltage deviation limits. TPL-001 is currently under development. This standard requires the TP/PC to ensure the system is adequately planned to meet performance criteria under credible contingencies with a variety of sensitivity assumptions. However, the standard could be modified to require documentation of the reactive power planning criteria (steady-state and dynamic) as well as the reactive power planning margins (e.g. from a PV or QV analysis).The SAR proposes to establish dynamic reactive power requirements and implies this should be a percentage of the overall reactive capability. However, there are other equally or more effective ways to ensure there is sufficient dynamic reactive power capability on-line that do not involve setting a percentage threshold.
Response: **The VRPC SAR DT thanks you for your comment. We have revised the SAR to include potential development of requirements that fit into the**		

Organization	Yes or No	Question 2 Comment
TPL standards. We have also revised the SAR to remove prescriptive language that might be construed as favoring one approach over another.		
ITC Holdings	No	The SAR attempts to solve all voltage stability issues by focusing exclusively on reactive reserve and by further breaking it down into two components of dynamic and static support. Reactive reserve is more closely tied to voltage collapse and voltage stability encompasses more than just voltage collapse. High voltage, which is known to damage equipment, may also result in lines being tripped in an area where there are many long lightly loaded transmission lines. There is no mention of a generator's leading capability (ability to absorb Mvar) or the status of shunt reactors to control high voltage. If the goal of the SAR is to ensure voltage stability on the BES, then more action/measures would be needed in addition to monitoring the amount of reactive reserve (dynamic and static). The concept of any type of stability in power systems invokes the idea of angular stability. There is no mention of this as a possible contributor to voltage instability in the SAR or white paper.
Response: The VRPC SAR DT thanks you for your comment. You are correct - the VRPC SAR and whitepaper do not specifically cover generator's leading capability (ability to absorb Mvar) or the status of shunt reactors to control high voltage. The SAR does not cover angular stability relationships to voltage magnitude, and does not cover the definition of voltage instability. However, the VRPC SAR should not explicitly cover, prescribe or define how these individual related issues will be covered in any standard revisions as this would be too prescriptive and limiting. It would be appropriate for the standard drafting team to address these issues while developing requirements.		
Northeast Power Coordinating Council	No	The SAR references VAR-001, Voltage and Reactive Control, and VAR-002, Generator Operation for Maintaining Network Voltage Schedules. Both of these standards are operating standards and not planning standards. Per the current SAR PURPOSE, the SAR includes a "review and update of a five year reactive support and control plan". This SAR DT should determine if this planning effort should either be included in the VAR standards, left entirely with the Project 2006-02, or that both projects should require a planning effort recognizing that consolidation might be required at a later date.
Response: The VRPC SAR DT thanks you for your comment. We have made the SAR less prescriptive throughout, and removed references to a 5 year plan.		
Duke Energy	No	The SAR should focus on "what" reactive power and voltage requirements need to be met, and should not attempt to direct "how" the requirements are to be met.
Response: The VRPC SAR DT thanks you for your comment. We have made the SAR less prescriptive throughout.		
Arizona Public Service Co. (APS)	No	The scope is somewhat vague, particularly the language about "Reactive Energy Conservation Plan." This is a physical reality and does not belong in a standard. Reactive shortages are local and should be dealt locally

Organization	Yes or No	Question 2 Comment
		and I am not sure what is the purpose of creating a standard on interconnection wide reactive energy conservation?
Response: The VRPC SAR DT thanks you for your comment. The concept of a Reactive Power Conservation Plan was edited in the SAR to be less prescriptive to allow the drafting team flexibility. The revised SAR has removed the prescriptive language - however neighboring PCs/TPs will need to identify a Reactive Power Conservation Plan within their footprint. The VRPC SAR does not prescribe "how" this is to be done. The whitepaper does provide some examples in Section 8 on "how" it could be done. However, the VRPC SAR (and above referenced whitepaper Section 6.2.4) does identify "what" topics must be covered in the criteria and VAR Plan - it will be addressed by neighboring PCs/TPs stated criteria and VAR Plans. After all of these VAR Plans are identified for subsequent RC and other entity review, each of the four Interconnections will be covered. No portion of an Interconnection will be exempt from such plans.		
US Bureau of Reclamation	No	The scope of the proposed standards actions failed to adequately address the issues detailed in the Reliability Standards Development Plan. It is not clear how the proposed standards action would address, expanding the applicability to include LSEs and reliability coordinators and define the reliability coordinators monitoring responsibilities; reactive power requirements for LSEs on a comparable basis with purchasing-selling entities; varying power factor requirements due to system conditions and equipment in the standards development process; including controllable load among the reactive resources to satisfy reactive requirements, considering the comments of Southern California Edison and SPA in the development of the standard; and, the power factor range at the interface between LSEs and the transmission grid. The scope of the proposed standard relies on a white paper which includes topics which are not required, as discussed in Question 1, as well as requirements covered by other standards. One example is the inclusion or equipment limits listed in Section 6.2 of the white paper as a part of the required Topic for the VAR Plan. Equipment limits are defined by the owner of the equipment as required by FAC008 and FAC009.
Response: The VRPC SAR DT thanks you for your comment. FERC Order 693 includes directives to include the RC and LSE in the revised standards. **(From Order 693, p 1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained.)** **(From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) (**From Order 693, **p 1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained.)** **The VRPC SAR (and referenced Section 6 of the whitepaper) covers the scope and intent of the above topics. The VRPC SAR does not prescribe "how" this is to be done. The whitepaper does provide some examples in Section 8 on "how" it *could* be done. However, the VRPC SAR (and above referenced**		

Organization	Yes or No	Question 2 Comment
whitepaper Section 6.2) does identify "what" topics must be covered in the criteria and VAR Plan.		
Midwest ISO Standards Collaborators	No	The scope of the SAR and associated whitepaper could cause the standards drafting team to focus their efforts on developing a prescriptive standard that focuses on "how" rather than "what". As an example, the SAR proposes to establish dynamic reactive power requirements and along with the white paper implies this should be a percentage of the overall reactive capability. There are other equally or more effective ways to ensure there is sufficient dynamic reactive power capability on-line that do not involve setting a percentage threshold. Establishing a voltage drop or deviation threshold following a contingency is one example that will allow an entity to manage dynamic reactive power without setting a direct threshold. The standard should not be so prescriptive that it prevents an entity from meeting the requirements in this manner.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to remove unduly prescriptive language.		
American Electric Power (AEP)	No	The scope of this SAR seems likely to overlap and possibly compete with existing planning and operating standards in that this SAR proposes to single out voltage control and reactive resources for special requirements. Voltage control and reactive resources already need to be planned and operated to achieve compliance with existing standards, such as in the TOP and TPL standards. It is unclear how logical groups of PC/TP's or "Transmission Planning Reactive Clusters" would be identified. We believe this identification is likely to be more difficult than the SAR or white paper seems to acknowledge. Even if such clusters could be identified, that further seems to imply the introduction of a new entity, a TRPC coordinator, who then must impose, on subsidiary entities, compliance to some yet to be defined criteria to be developed in a yet to be defined process, neither of which can possibly be written into a continent-wide standard as the SAR readily admits. The scope and substance of this SAR is too ambiguous for a commenting entity to support. To the extent that it is necessary, the proposed requirement for a five-year reactive support and control plan properly belongs within the TPL standards, not in a separate VAR standard. Any five-year reactive support and control plan is simply a subset of whatever plans are necessary to comply with TPL standards within the five-year transmission planning horizon specified in those standards. Finally, why should other standards need to be reviewed and updated to be consistent with a revision to the VAR standards that is yet to be produced; and why not create a revision to the VAR standards be reviewed and updated to be consistent with transmission planning and other operating standards? It is our belief that the existing planning and operating standards already cover the need for voltage control and reactive resource criteria and that this SAR may be unnecessarily duplicative.
Response: The VRPC SAR DT thanks you for your comment. References to "Clusters" and the 5 year planning horizon have been removed from the SAR and we have also revised the SAR to include potential requirements in the TPL standards as well as the VAR standards.		

Organization	Yes or No	Question 2 Comment
Electric Market Policy	No	The scope should be limited to only that required by FERC order 693.We do not agree with the proposed Transmission Planning Reactive Cluster (TPRC). Even those drafting this whitepaper stated that "reactive power needs vary significantly based on system characteristics and since the vast majority of reactive power must be supplied locally, it is not appropriate to establish a NERC wide reactive reserve requirement." Currently voltage/reactive requirements are developed by the Transmission Owner (TO), Transmission Operator (TOP) and Transmission Planner (TP). If the creation of a TPRC deemed essential to the reliability of the grid, it should be left entirely to the discretion of the TO, TOP and TP based on their system characteristics and operating experiences. Not all systems/areas would have a need for a TPRC. We believe these entities are the only entities that need to determine the requirements. The requirements should then be included in the various agreement (interconnection, operating etc.) between these entities and others.
Response: The VRPC SAR DT thanks you for your comment. References to "Clusters" and the 5 year planning horizon have been removed from the SAR and we have also revised the SAR to include potential requirements in the TPL standards as well as the VAR standards.		
Bonneville Power Administration	No	The White Paper defined scope for the purpose of identifying "what technical requirements are needed to determine the reactive resources required under different system states", is well intended, however standard requirements may not address local or regional reliability concerns. BPA conducts extensive system studies in determining appropriate reactive resources and margins for interchange and internal to the BAA. The BPA Voltage Schedule has been well coordinated and examined, and the voltage schedule directives are incorporated into the seasonal studies and the daily outage studies. It is not apparent how, or if this proposal will improve upon this methodology and process.
Response: The VRPC SAR DT thanks you for your comment. The SAR DT strongly encourages you to provide specific methodologies and recommendations to the standard drafting team for their consideration.		
Independent Electricity System Operator	No	We do not agree with the need and therefore the issue of scope is not relevant. Not withstanding this response, we disagree with the scope of the SAR to develop a set planning and operational planning "protocol" such as "expectations among the functional entities within the associated Transmission Owner (TO) footprints" that largely stipulates the "How" but not the "What". We are also unclear on the role of the so-called Transmission Planning Reactive Cluster? (TPRC) and how the role of this entity differs from the Planning Coordinators who coordinates plans among Transmission Planners. And with the NERC standards stipulating the requirement to include identification of reactive capability in both planning and operational planning time horizons, TOPs and RCs to develop SOLs and IROLs with inclusion of reactive power requirements in the limits, and their authority to direct other entities to meet voltage schedules, we question the need for the TPRC even if a separate standard were to be developed.

Organization	Yes or No	Question 2 Comment
Response: The VRPC SAR DT thanks you for your comment. References to "Clusters" and the 5 year planning horizon have been removed from the SAR and we have also revised the SAR to include potential requirements in the TPL standards as well as the VAR standards.		
SERC Planning Standards Subcommittee	No	While certain aspects of this scope may belong in existing or new VAR standards, the long term planning aspects should be incorporated into the TPL standards.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to include potential development of requirements that fit into the TPL standards. See the revised SAR. References to the 5 year planning horizon have been removed.		
Florida Municipal Power Agency, and its Member City, Lakeland Electric	No	While FMPA agrees that the actions contemplated are important, we are concerned about the standards being impacted, e.g., will the requirements be part of the "proper" standards. The standard action should not be to revise the VAR-001-1a standard, but to subsume its requirements into other standards in the same way we plan, design and operate the power system to thermal and transient stability limits. The existing VAR-001-1a standard mixes planning, design and operations into the same standard, which is confusing. For instance:* VAR-001-1a, R1 is redundant with TOP-004-2, R6 and should only be in TOP-004* VAR-001-1a, R2 and R9 encompass multiple time frames and ought to be subsumed in TOP-002-2a for operations planning horizon, and be applicable to Transmission Planners in TPL-001-1 in the planning horizon.* VAR-001-1a, R3 can easily be subsumed in a TOP standard* VAR-001-1a, R4 should also be subsumed in TOP-002 and be part of the operating plan* VAR-001-1a, R5 ought to be subsumed in INT-001* VAR-001-1a, R6 is duplicative of TOP-006-2, R1* VAR-001-1a, R7 is duplicative of TOP-001-1* VAR-001-1a, R8, R10 and R12 are duplicative of each other and of TOP-004-2 and TOP-007-0* VAR-001-1a, R11 ought to be subsumed in a TOP standard, possibly a new standard for voltage and reactive control in the TOP standards as opposed to a VAR standard. Which would leave the requirements of generators as the only VAR standard. Other action called out in the SAR are also already applicable in other standards and should be subsumed in those other standards, e.g,* Equipment limits " FAC-008* Operating to equipment limits and SOLs / IROLs associated with voltage collapse " TOP standards, SOLs* Planning criteria, 5 year reactive resource plan " TPL-001-1, or a new TPL standard
Response: The VRPC SAR DT thanks you for your detailed comments on how to handle the many related Requirements in the existing Standards. Within the scope of the SAR, the VRPC SAR DT expects the future VAR Standard Drafting Team to examine these technical details and recommend changes to other Standards as deemed appropriate. The VRPC SAR will not prescribe how each of the above Requirements should be handled. Please also see the revised SAR.		
American Transmission Company	No	While the scope of the SAR should include addressing the FERC Order 693 directives, the scope should not reflect everything in the TIS "Reactive Support & Control Whitepaper". Perhaps the scope of the SAR should be modified to identify the specific elements from the paper that are to be incorporated into the revisions of

Organization	Yes or No	Question 2 Comment
		VAR-001-1 and VAR-002-1. We do not agree with “blank check” approval of incorporating any or all of the elements in the white paper.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to change “reflect” to “consider” with respect to the Whitepaper.		
MRO NERC Standards Review Subcommittee	No	While the scope of the SAR should include addressing the FERC Order 693 directives, the MRO NSRS urges the use of caution in utilizing elements in the TIS “Reactive Support & Control Whitepaper” that have not been tested or proven. The scope of the SAR and associated whitepaper could cause the standards drafting team to focus their efforts on developing a prescriptive standard that focuses on “how” rather than “what”. As an example, the SAR proposes to establish dynamic reactive power requirements and along with the white paper implies this should be a percentage of the overall reactive capability. There are other equally or more effective ways to ensure there is sufficient dynamic reactive power capability on-line that do not involve setting a percentage threshold. Establishing a voltage drop or deviation threshold following a contingency is one example that will allow an entity to manage dynamic reactive power without setting a direct threshold. The standard should not be so prescriptive that it prevents an entity from meeting the requirements in this manner.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to change “reflect” to “consider” with respect to the Whitepaper. We have also revised the SAR to remove unduly prescriptive language.		
US Army Corps of Engineers, Northwestern Division	No	Why are GO/TO equipment limits part of this standard when they are already covered in the FAC Reliability Standards? It also appears that the intent of the scope is to "require" infrastructure development based on planning horizon timeframe studies as opposed to meeting present operational reliability needs?
Response: The VRPC SAR DT thanks you for your comment. Please see the revised SAR language. We agree the VAR standards should not include any specific requirements to enlarge such facilities or to construct new transmission capacity or generation capacity.		
Entergy	Yes	
RRI Energy Inc	Yes	
SCE&G	Yes	
Southern Company	Yes	

Organization	Yes or No	Question 2 Comment
We Energies	Yes	
Xcel Energy	Yes	Agree with the concept of needing to more locally analyze and document reactive power requirements, but have a concern about creating another entity (TPRC) that has responsibilities and requirements, and exactly how would one agree as to who would take on that role? Suggest removing that language from the SAR and replace it with something more generic such as 'determine which of the existing functional entities would be responsible for analyzing, documenting and coordinating reactive power requirements' and include a phrase indicating that the functional model may need modification (of existing entities or the additional of an entity) to address responsibilities identified by the SDT.
Response: The VRPC SAR DT thanks you for your comment. References to "Clusters" have been removed. The neighboring PCs/TPs will address this in their criteria, methodologies and VAR Plans. See the revised SAR.		

3. Do you agree that the scope of the proposed standards action addresses the relevant directives from Order 693? If you disagree with the proposed method of addressing a directive, or if you believe that one or more of the directives isn't addressed, please identify the directive and provide a suggestion for achieving the reliability intent of that directive.

Summary Consideration: Most stakeholders agree that the proposed standards action addresses the relevant FERC Order 693 directives. One stakeholder indicated that the manner in which the ERO, via the SAR and white paper, attempts to address the directives is not clear. We have redrafted the SAR to not be prescriptive and allow the drafting team to address the FERC Order 693 directives. The SAR has been revised to state that the drafting team will "consider" the white paper (rather than "reflect") which addresses various aspects of voltage and reactive control and planning. Based on stakeholder comments below, we have revised the SAR language to be less prescriptive throughout. Also, the LSE directive from Order 693 has been explicitly added to the body of the SAR:

> FERC Order 693 directed the ERO to treat LSEs and PSEs on a comparable basis. [paragraph 1858 . . "to address the reactive power requirements for LSEs on a comparable basis with purchasing-selling entities." . . and paragraph 1861 . . "We direct the ERO to develop appropriate modifications to this Reliability Standard [VAR-001-1] to address the power factor range at the interface between LSEs and the Bulk-Power System."]

Organization	Yes or No	Question 3 Comment
Bonneville Power Administration		No comment
Florida Municipal Power Agency, and its Member City, Lakeland Electric		See comments to 2, above. We agree largely with the proposed scope, we disagree with the "categorization" of where different activities in the scope "fit" within the standards.
Response: The VRPC SAR DT thanks you for your comment. Within the scope of the SAR, the VRPC SAR DT expects the future VAR Standard Drafting Team to examine the technical details and recommend changes to other Standards as deemed appropriate. Please also see the revised SAR.		
US Army Corps of Engineers, Northwestern Division	No	It appears that the FERC directive to include LSEs in the group of responsible entities for meeting reactive needs of the power system has not been addressed but instead has been passed onto DPs. LSEs account for a much larger load on the system and yet they appear to be getting a free ride, thus FERC's directive to address Functional Entity equity issues. Also, the white paper starts off recognizing that firm limits for reactive requirements can not be developed because of local/regional differences and then the SAR proposes setting limits. Firm limits should be based on local/regional power grid topography.
Response: The VRPC SAR DT thanks you for your comment. See the revised SAR. We have added the LSE as an applicable entity to the SAR. The		

Organization	Yes or No	Question 3 Comment
LSE's role shall be addressed by the standard drafting team as they develop requirements.		
American Electric Power (AEP)	No	Order 693 phrases referenced in the SAR on the need for "established limits" and "sufficient reactive resources," and otherwise to identify acceptable margins to instability, are objectives already being achieved by TP's, TOP's, PC's and RC's, etc. in areas where it makes sense to do that in order to comply with existing planning and operating standards. We question the need to pancake another standard on top of already existing standards to accomplish these Order 693 objectives. Perhaps all that is necessary is to update existing planning and operating standards to give voltage control and reactive resources more visibility.
Response: The VRPC SAR DT thanks you for your comment. Within the scope of the SAR, the future VAR Standard Drafting Team will examine the technical details and recommend changes to other Standards as deemed appropriate. Existing explicit reactive power and control requirements will not be duplicated in the VAR Standards.		
Independent Electricity System Operator	No	Please see our suggested alternatives to meet the directives in FERC Order 693 provided in our response to Q1.
Response: The VRPC SAR DT thanks you for your comment. Please see response to Q1.		
Georgia Transmission Corporation and Georgia System Operations	No	See question #2.
Response: The VRPC SAR DT thanks you for your comment. Please see response to Q2.		
ITC Holdings	No	The directives of the Commission are clear, but the manner in which the ERO via the SAR and white paper attempts to address these directives are not. The focus seems to be exclusively on preventing voltage collapse by determining a split of static and dynamic reactive power reserves. This approach alone will not keep a power system from being voltage unstable, but it may prevent a voltage collapse. The objective of the SAR and whitepaper would be clearer if it defined what it means for a transmission system to be voltage stable. What should all the functional entities strive for in order to remain above voltage instability points as indicated by the Commission?
Response: The VRPC SAR DT thanks you for your comment. We have redrafted the SAR to not be prescriptive and allow the drafting team to address the FERC Order 693 directives. The SAR has been revised to state that the drafting team will "consider" the white paper (rather than "reflect") which addresses various aspects of voltage and reactive control ad planning.		

Organization	Yes or No	Question 3 Comment
Southern Company	No	The SAR states “the standard must include requirements for the appropriate functional entities to clearly define what voltage limits are used and how much reactive resources are needed to ensure voltage instability will not occur under normal and emergency conditions.” However, the SAR and the Whitepaper state “Reactive power planning and operational techniques vary across the United States and Canada. In some areas voltage is a major concern and requires extensive study, while in other areas voltage problems rarely arise. However, in all cases the planning and operational techniques should be well documented and made available to those functional entities which have a reliability role within an interconnection.”
Response: The VRPC SAR DT thanks you for your comment. We have revised the sentence to provide more clarity of our intent. The new sentence reads: As stated by FERC Order 693, “the Reliability Standard would benefit from having more defined requirements that clearly define what voltage limits are used and how much reactive resources are needed to ensure voltage instability will not occur under normal and emergency conditions” as defined by NERC Reliability Standards.		
US Bureau of Reclamation	No	While the scope exceeds the intent of FERC Order 693, some of the specific elements detailed in the proposed actions meet part of the intent of FERC Order 693. The white paper has many excellent approaches to ensure reliable operation of the BPS such as the approach to ensure that system reactive balance is analyzed at the various system states (near term); however, in response to the need to provide more detailed and definitive requirement on establishing limits and sufficient reactive resources, the scope infers that the standard will set the limits. Those limits should be established by the appropriate functional entity based sound technical analysis in accordance with the Requirements established through this process. The scope did not adequately address the role of the LSE as required by FERC Order 693. The LSE is required to provide reactive power to appropriately compensate for the demand they are meeting for their customers. The scope fell short by placing that requirement on the DP's. In addition, the scope failed to adequately include the role of the GO, TO and BA in the planning role for reactive support. Finally, FERC intended to that the results from implementing the VAR criteria for transmission interface would feed into the TPL standards rather than duplicating the planning in the VAR standards.
Response: The VRPC SAR DT thanks you for your comment. The VRPC SAR DT agrees with your comment that the requirements established by the standard drafting team will establish the criteria and methodologies necessary to meet the objectives. The SAR language has been revised to be less prescriptive throughout. **The LSE directive from Order 693 has been explicitly added to the body of the SAR:** FERC Order 693 directed the ERO to treat LSEs and PSEs on a comparable basis. [paragraph 1858 . . “to address the reactive power requirements for LSEs		

Organization	Yes or No	Question 3 Comment
on a comparable basis with purchasing-selling entities." . . and paragraph 1861 . . "We direct the ERO to develop appropriate modifications to this Reliability Standard [VAR-001-1] to address the power factor range at the interface between LSEs and the Bulk-Power System."]		
Entergy	Yes	
FirstEnergy Corp	Yes	
SCE&G	Yes	
SERC Planning Standards Subcommittee	Yes	
We Energies	Yes	
Northeast Power Coordinating Council	Yes	All 3 projects address different aspects of FERC's directives.
Response: The VRPC SAR DT thanks you for your comment.		
Manitoba Hydro	Yes	The drafting team may offer alternatives to the directives as long as the team considers the reliability intent of the directives.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		
MRO NERC Standards Review Subcommittee	Yes	The MRO NSRS believes the scope of the drafting team is clear that it plans to address the FERC directives. The MRO NSRS cautions and reminds the drafting team that by the Commission's own statements in subsequent standards rulings and orders that the directives only require the drafting team to consider the reliability intent of the directive and the drafting team could offer equally effective alternatives to the Commission's directives. Furthermore, the NERC standards committee has developed a policy that FERC directives must be addressed by implementing the recommendation, developing an equally effective alternative or providing a reliability reason why implementation of the directive is unnecessary or might compromise reliability.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting		

Organization	Yes or No	Question 3 Comment
Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		
Duke Energy	Yes	The scope of the SAR addresses the FERC directives. However FERC only requires that the reliability intent of its directives be addressed. NERC is allowed to offer equally effective alternatives to FERC directives, or can provide reliability-related reasons not to implement FERC directives. The standard drafting team should not be limited in how it responds to the FERC directives.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		
American Transmission Company	Yes	We believe the scope of the drafting team is clear that it plans to address the FERC directives. We caution and remind the drafting team that by the Commission's own statements in subsequent standards rulings and orders that the directives only require the drafting team to consider the reliability intent of the directive and the drafting team could offer equally effective alternatives to the Commission's directives. Furthermore, the NERC standards committee has developed a policy that FERC directives must be addressed by implementing the recommendation, developing an equally effective alternative or providing a reliability reason why implementation of the directive is unnecessary or might compromise reliability.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		
IRC Standards Review Committee	Yes	We believe the scope of the drafting team is clear that it plans to address the FERC directives. We caution and remind the drafting team that by the Commission's own statements in subsequent standards rulings and orders that the directives only require the drafting team to consider the reliability intent of the directive and the drafting team could offer equally effective alternatives to the Commission's directives. Furthermore, the NERC standards committee has developed a policy that FERC directives must be addressed by implementing the recommendation, developing an equally effective alternative or providing a reliability reason why implementation of the directive is unnecessary or might compromise reliability. As an alternative to meeting the directives in FERC Order 693, please see our suggested approach presented under Q1.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		
Midwest ISO Standards Collaborators	Yes	We believe the scope of the drafting team is clear that it plans to address the FERC directives. We caution and remind the drafting team that by the Commission's own statements in subsequent standards rulings and orders that the directives only require the drafting team to consider the reliability intent of the directive and

Organization	Yes or No	Question 3 Comment
		the drafting team could offer equally effective alternatives to the Commission's directives. Furthermore, the NERC standards committee has developed a policy that FERC directives must be addressed by implementing the recommendation, developing an equally effective alternative or providing a reliability reason why implementation of the directive is unnecessary or might compromise reliability.
Response: The VRPC SAR DT thanks you for your comment. We agree with your comment. Within the scope of the SAR, the VAR Standard Drafting Team will examine the technical details and recommend changes to Standards to meet the intent of the VAR related FERC Order directives.		

4. Do you agree with the applicability of the proposed standards action? If not, please explain in the comment area.

Summary Consideration: Most stakeholders agreed with the applicability of the SAR with a few exceptions. The Resource Planner and Market Operator were removed as applicable entities based on stakeholder comments and the Balancing Authority was added. Some stakeholders questioned having the PSE and LSE as applicable entities. These entities are explicitly listed in FERC Order 693 directives. In order to address these directives fully, these entities must be listed as possible applicable entities. Other stakeholders had comments concerning issues other than applicability. We have eliminated the five-year VAR Plan requirement and added the TPL standards as standards which may be revised under this SAR.

Organization	Yes or No	Question 4 Comment
Southern Company	No	A five-year VAR Plan as stated in the SAR may not be practical. Unlike the construction of a transmission line, a typical fix for a reactive/voltage problem is installing a transmission static capacitor bank which can be completed within one year. Consequently, voltage/reactive planning related studies are traditionally concentrated for the next 2~3 years. The SAR states "Dynamic Var Requirements" must be covered in the criteria and VAR Plan. The new TPL-001-1 has added the requirement of including a load model which represents the dynamic behavior of loads. By doing so, the study/assessment should have covered the requirements on the dynamic var.
Response: The VRPC SAR DT thanks you for your comment. We have eliminated the five-year VAR Plan requirement and added the TPL standards as standards which may be revised under this SAR. See the revised SAR.		
MRO NERC Standards Review Subcommittee	No	A. Resource Planning has historically focused on ensuring an LSE has real power (MW) resources sufficient to supply its real load plus reserve margin; this is a generation planning function. In contrast, Voltage and Reactive Planning and Control are primarily transmission planning and transmission operation functions. Any contemplated standard should avoid requiring a Resource Planner, Generator Owner, or Generator Operator in any way to morph into a Transmission Planner. Generation Owners can provide information about the VAR and voltage control capabilities of the resources (generators) under their control. Generator owners can comply with requirements of generator interconnection agreements. Generator operators can, within the operating limits of the generators, follow prescribed voltage schedules. But Generator Owners/Operators and Resource Planners who are not also Transmission Planners and Transmission Operators are not in a position to develop, and should not have responsibility for developing, voltage or VAR plans and should not have responsibility for controlling transmission system voltage, except that Generator Operators should follow reasonable and prudent directions from the Transmission Operator in providing system voltage support. Assessing VAR adequacy and developing voltage and VAR plans are Transmission Planning functions that require the use of transmission system models and simulations.

Organization	Yes or No	Question 4 Comment
		Similarly, ensuring VAR adequacy for the transmission system should be a transmission system planning and operating responsibility. Controlling transmission voltages should be the responsibility of the Transmission Operator with authority to direct resource operators to follow voltage or VAR schedules within the resource operating limits. B. The MRO NSRS does not know of specific reasons why the standard should be applicable to the Load Servicing Entity, Distribution Provider, Purchase Selling Entity, Market Operator, or Resource Planner. It is unclear why the Distribution Provider should be applicable in this instance please share the rationale for their inclusion. C. The MRO NSRS also believes the Balancing Authority may have a small role such as following the directive of a Transmission Operator or Reliability Coordinator to adjust generation patterns to allow more VAR output from generators or to bring off-line generators on-line for VAR support.
Response: The VRPC SAR DT thanks you for your comment. **A. The standard drafting team will develop requirements for various functional entities as necessary to meet the scope of the SAR. In order for entities to be considered, they must be in the SAR. The VRPC SAR DT has included these entities (except Resource Planner) as *possible* applicable entities.** **B. In order for these entities to be considered, they must be in the SAR. The VRPC SAR DT has included these entities (except Resource Planner, which was removed) as *possible* applicable entities. Since an LSE may not own any assets, the DP must be included as a potential applicable entity because they do own assets which may be used for voltage and reactive control. In addition, FERC Order 693 includes language directing that LSEs be included in the revised standards. (From Order 693, p1896:** Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) **The standard drafting team will develop requirements for various functional entities as necessary to meet the scope of the SAR.** **C. We have added the Balancing Authority to the applicable entities section.**		
RRI Energy Inc	No	Applicability should be generator owner only. In those situations where the GO is not the operator a JRO is in place for the operator to comply with the GO requirements.
Response: The VRPC SAR DT thanks you for your comment. The standard drafting team will develop requirements for various functional entities as necessary to meet the scope of the SAR. In order for entities to be considered, they must be in the SAR. The VRPC SAR DT has included these entities (except Resource Planner) as *possible* applicable entities. FERC Order 693 includes directives to add requirements for the RC and LSE. **From Order 693,** p 1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained.		

Organization	Yes or No	Question 4 Comment
From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions. **The VAR Standards apply to many entities including the Generation Owner.**		
Duke Energy	No	It is appropriate to consider applicability to many entities at this stage, although ultimately, many entities may not have a role. The standards drafting team can make that determination in the course of its work.
Response: The VRPC SAR DT thanks you for your comment. The standard drafting team will develop requirements for various functional entities as necessary to meet the scope of the SAR. In order for entities to be considered, they must be in the SAR.		
Xcel Energy	No	It is not clear as to how the PSE and Market Operator could have any responsibility for voltage and reactive control or maintaining network voltage schedules.
Response: The VRPC SAR DT thanks you for your comment. The PSE is included because it is mentioned in a FERC Order 693 directive. **From Order 693, p1896:** Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions. **In addition, VAR-001 currently has a requirement for the PSE:** R5. Each Purchasing-Selling Entity shall arrange for (self-provide or purchase) reactive resources to satisfy its reactive requirements identified by its Transmission Service Provider. Each Purchasing-Selling Entity shall arrange for (self-provide or purchase) reactive resources to satisfy its reactive requirements identified by its Transmission Service Provider. **We removed Market Operator from the applicable functions.**		
Manitoba Hydro	No	Manitoba Hydro is unclear as to why the standard should be applicable to the Distribution Provider. Manitoba Hydro believes the standard may be applicable to the Balancing Authority as the Balancing Authority may need to adjust generation patterns to allow for increased VAR output and support. Assessing VAR adequacy and developing voltage and VAR plans are Transmission Planning, not Resource Planning functions. Controlling transmission voltages and ensuring VAR adequacy for the transmission system are Transmission Operating and Transmission Planning functions.
Response: The VRPC SAR DT thanks you for your comment. The DP must be included as a potential applicable entity because it owns assets which may be used for voltage and reactive control and reactive support. We have added BA and removed RP as an applicable entity.		

Organization	Yes or No	Question 4 Comment
Independent Electricity System Operator	No	Please see our suggested alternatives to meet the directives in FERC Order 693 provided in our response to Q1. Notwithstanding this response, and even if a reactive capability standard were to be developed, we do not agree with the role of some entities, e.g. Purchasing-Selling Entity, Market Operator and Load-Serving Entity, in the standard.
Response: The VRPC SAR DT thanks you for your comment. The existing VAR-001 standard applies to the PSE. FERC Order 693 directives also explicitly lists both the PSE and LSE as responsible entities. (From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) **In order for entities to be considered in the associated standards, they must be identified in the SAR. The VRPC SAR DT has included these entities as *possible* applicable entities. We have also added the Balancing Authority to the applicable entities and we have removed Market Operator.**		
Northeast Power Coordinating Council	No	See comments made in response to question 2.
Response: The VRPC SAR DT thanks you for your comment. Please see response to Q2.		
US Bureau of Reclamation	No	The answer is forced to "no" based on fact that the scope exceeded the reliability need. The actions that support more detailed and definitive requirement on establishing limits and sufficient reactive resources and define criteria within the scope of a reliability need and existing grid resources are very applicable. Those actions that define long range plans or planning objectives are not.
Response: The VRPC SAR DT thanks you for your comment. We have removed reference to the 5 year plan from the SAR. We have also added the TPL standards as standards to be possibly revised under the SAR.		
Arizona Public Service Co.	No	The drafting team should have the flexibility to determine the applicability.
Response: The VRPC SAR DT thanks you for your comment. In order for entities to be considered, they must be included in the SAR. The standard drafting team will determine applicability of requirements.		
US Army Corps of Engineers, Northwestern Division	No	The proposed standard is attempting to set future design and resource requirements (with major market impact issues) which is beyond what Reliability Standards are to accomplish. Reliability Standards should not be aimed at anything other than BES operational reliability (present time frame).
Response: The VRPC SAR DT thanks you for your comment. Standards apply in both real-time operations and planning environments. We have removed reference to the 5 year plan from the SAR. We have also added the TPL standards as standards to be possibly revised under the SAR in order to		

Organization	Yes or No	Question 4 Comment
separate the planning and operating requirements.		
Bonneville Power Administration	No	The scope is more suitable to a separate and new standard, applicable to the long range planning. That new standard may be more appropriately placed in with the TPL group of standards to separate it from the current VAR standards which deal more with real time operations. It should be tailored to address reliability only.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards to be possibly revised under the SAR in order to separate the planning and operating requirements. The Market Operator was removed from the SAR.		
American Electric Power (AEP)	No	The VAR standards should not expand the applicability to transmission planning entities because transmission planning is already covered by TPL standards. Furthermore, the PSE and LSE are generally not owners BPS facilities, but are, instead, users of the BPS. This differentiation is important in that the PSE and LSE entities can not provide a review of planning and operating protocols necessary to ensure sufficient reactive resources, acceptable voltage and reactive margins, and prevent voltage instability, as defined as the purpose of the SAR.
Response: The VRPC SAR DT thanks you for your comment. We have also added the TPL standards as standards to be possibly revised under the SAR in order to separate the planning and operating requirements. The PSE and LSE entities are listed in FERC Order 693 directives to "address on a comparable basis". It is appropriate for them to be in the SAR. (From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.)		
IRC Standards Review Committee	No	We do not agree with the need of this standard and therefore the applicability is irrelevant. Notwithstanding this response, we largely agree with the entities that must be considered if a reactive capability standard were to be developed. However, we caution that there are many entities such as the LSE, PSE and Market Operator that may not have a role. Of course, that can be determined by the standards drafting team later. We also believe the BA may have a small role such as following the directive of a TOP or RC to adjust generation patterns to allow more VAR output from generators or to bring off-line generators on-line for VAR support.
Response: The VRPC SAR DT thanks you for your comment. The PSE and LSE entities are listed in FERC Order 693 directives to "address on a comparable basis". (From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) **It is appropriate for these entities to be identified in the SAR. We have also added the**		

Organization	Yes or No	Question 4 Comment
Balancing Authority to the applicable entities and we have removed the Market Operator.		
American Transmission Company	No	We do not know of specific reasons why the standard should be applicable to the Market Operator, Reliability Coordinator, or Resource Planner.
Response: The VRPC SAR DT thanks you for your comment. We have removed the Market Operator and Resource Planner as applicable entities. The Reliability Coordinator has a role in real-time operations (and is identified as a responsible entity in Order 693) and therefore will remain in the SAR. (From Order 693, p 1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained.)		
FirstEnergy Corp	No	We largely agree with the applicable entities that must be considered for the draft standards. We also believe the BA may have a small role such as following the directive of a TOP or RC to adjust generation patterns to allow more VAR output from generators or to bring off-line generators on-line for VAR support.
Response: The VRPC SAR DT thanks you for your comment. We have added the Balancing Authority to the applicable entities.		
Midwest ISO Standards Collaborators	No	We largely agree with the entities that must be considered for the draft standards. However, we caution that there are many entities such as the LSE and PSE that may not have a role. Of course, that can be determined by the standards drafting team later. We also believe the BA may have a small role such as following the directive of a TOP or RC to adjust generation patterns to allow more VAR output from generators or to bring off-line generators on-line for VAR support.
Response: The VRPC SAR DT thanks you for your comment. The PSE and LSE entities are listed in FERC Order 693 directives to "address on a comparable basis". (From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) **It is appropriate for these entities to be identified in the SAR. We have also added the Balancing Authority to the applicable entities and we have removed the Market Operator.**		
SERC Planning Standards Subcommittee	No	While it is difficult to determine the applicability at this point, as noted in our response to question 2 above, applicability of the TP and PC should be removed from this SAR.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards to be possibly revised under the SAR in order to separate the planning and operating requirements. Therefore, the TP and PC should remain as applicable entities. Please see response to Q2.		
Electric Market Policy	No	While we agree that the scope extends to Reliability Coordinators and LSEs as directed by FERC, We believe that it should not or that the requirements imposed on these entities should be more limited than

Organization	Yes or No	Question 4 Comment
		shown in the document. All load is connected to either transmission or distribution facilities. As such, the owners, planners and operators of these facilities should bear responsibility for developing reactive, power factor and voltage requirements, processes and procedures for their facilities that meet NERC or regional reliability standards. The facility owner should include these reactive, power factor and voltage requirements in interconnection agreements between themselves and interconnected customers. Reliability Coordinators are neither owners nor planners and should not be included in standards that require reactive planning. We agree that they should be included in the Operations Review cycle, but, that their participation should be limited to review of recent operating experience and development of short-term mitigation plans (such as implementation of load management, voltage reduction, etc) to be used ONLY during times when reactive supply and demand are not equal. Most PSEs and LSEs don't own physical assets used in the production, transport or consumption of electrical energy (real or reactive). These entities typically procure these, and associated products (capacity, regulation and reserve), using facilities owned by others, on behalf of end-use customers. For this reason, it is unreasonable to apply reliability standards that require the owners and/or planners of assets to entities that do neither.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards to be possibly revised under the SAR in order to separate the planning and operating requirements. The PSE and LSE entities are listed in FERC Order 693 directives to "address on a comparable basis". It is appropriate for them to be in the SAR. (From Order 693, p1896: Both LSEs and purchasing-selling entities should have some requirements to provide reactive power to appropriately compensate for the demand they are meeting for their customers. Neither a purchasing-selling entity nor a LSE should depend on the transmission operator to supply reactive power for their loads during normal or emergency conditions.) (**From Order 693,** p 1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained.)**The standard drafting team will determine applicability of the requirements for operating and/or planning entities.**		
Entergy	Yes	
Georgia Transmission Corporation and Georgia System Operations	Yes	
SCE&G	Yes	
We Energies	Yes	
ITC Holdings	Yes	The applicability of the Load-Serving Entities (LSE) and Reliability Coordinators (RC) is appropriate in supporting voltage and reactive power control on the BES. Reactive power support is most effective when used closest to the load and the LSEs are typically best suited to address this. The RC's are supposed to

Organization	Yes or No	Question 4 Comment
		have the regional perspective and therefore are best suited to observe/direct the use of reactive power from transmission provider to transmission provider. Reactive power typically doesn't travel too far on the transmission system and tends to be more of a local issue. However, if the voltage issue is large enough it can manifest itself from a local to a regional problem very quickly and this is a where the RC is best suited to take action.
Response: The VRPC SAR DT thanks you for your comment.		

5. If you are aware of the need for any regional variances or business practices that should be considered with this SAR, please identify them.

Summary Consideration: The majority of stakeholders did not identify any regional variances or business practices. One stakeholder suggested that a summer peak region and a winter peak region should have different var planning strategy to better fit its unique system condition. The revised SAR states:

> Reactive power needs vary significantly based on system characteristics, and because reactive power needs to be supplied locally, it may not be appropriate to establish a continent-wide reactive reserve requirement.

Another stakeholder suggested that variations in voltage schedules/levels should be considered in the SAR. The VRPC SAR DT believes that neighboring PCs / TPs will need to coordinate to take this into account. The revised SAR states:

> The neighboring PCs/TPs and their associated functional entities must establish appropriate criteria for the area under consideration. Such areas may have differing detailed criteria and requirements for static and dynamic reactive support, based on the area's characteristics.

Organization	Regional Variance or Business Practice	Question 5 Comment
MRO NERC Standards Review Subcommittee		N/A
ITC Holdings		None
SCE&G		None known
American Electric Power (AEP)		There are no known regional variances or regional business practices that need to be considered.
IRC Standards Review Committee	Business Practice	The Standard should recognize and encourage market participants' participation in accordance with established Tariff provisions for voltage and reactive control or voltage support ancillary service.
Response: The VRPC SAR DT thanks you for your comment. The standard drafting team will determine the requirements for operating and/or planning entities. The transparency being introduced by this SAR will enable market participation as it will help to identify local needs to other functional entities.		

Organization	Regional Variance or Business Practice	Question 5 Comment
Southern Company	Regional Variance	A summer peak region and a winter peak region should have different var planning strategy to better fit its unique system condition. For instance, a summer peak system which has more air conditioning loads may have poorer power factor and may require more dynamic var support. A winter peak system, on the other hand, may have a better power factor and may have less need on dynamic var support.
Response: The VRPC SAR DT thanks you for your comment. The revised SAR states: Reactive power needs vary significantly based on system characteristics, and because reactive power needs to be supplied locally, it may not be appropriate to establish a continent-wide reactive reserve requirement.		
Entergy	Regional Variance	Because of the equipment/design limitations various entities in a region operate their BES at different voltage schedules/levels. These variances should be considered in the SAR.
Response: The VRPC SAR DT thanks you for your comment. Neighboring PCs / TPs will need to coordinate to take into account the items you address. The revised SAR states: The neighboring PCs/TPs and their associated functional entities must establish appropriate criteria for the area under consideration. Such areas may have differing detailed criteria and requirements for static and dynamic reactive support, based on the area's characteristics.		
Xcel Energy	Regional Variance	Ensure that consideration is taken for any regional standards related to voltage control/voltage regulators/PSS (e.g. - VAR-STD-002a & 002b and their pending replacements)
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to add: The VAR Standard Drafting Team should also be cognizant of all regional standards such as: WECC Standard VAR-STD-002a-1 – Automatic Voltage Regulators TPL – (001 thru 004) – WECC – 1 – CR ─ System Performance Criteria		
Northeast Power Coordinating Council	Regional Variance	Regional Variance: At this time, it is not known if regional variances are required because T&D systems vary throughout North America. Large cities have high density loads and significant underground transmission and distribution facilities. These types of transmission and distribution systems have different reactive power planning and

Organization	Regional Variance or Business Practice	Question 5 Comment
		operating requirements than systems that are predominantly overhead. Business Practice: At this time, it is not known if any regional variances are required. In different regions of the country, energy markets may be administered by independent system operators, regional transmission operators, power pools, or by a single utility resulting in different business practices.
Response: The VRPC SAR DT thanks you for your comment. The revised SAR states: Reactive power needs vary significantly based on system characteristics, and because reactive power needs to be supplied locally, it may not be appropriate to establish a continent- wide reactive reserve requirement. **Also, The standard drafting team will determine the requirements for operating and/or planning entities. The transparency being introduced by this SAR will enable market participation as it will help to identify local needs to other functional entities.**		

6. If you have any other comments on the SAR that you haven't already provided in response to the previous questions, please provide them here.

Summary Consideration: A few stakeholders made suggestions more suited to the standard development process. The VRPC SAR DT will forward these comments to the standard drafting team for its consideration. Several stakeholders reiterated their earlier comments regarding prescriptive language in the SAR and that the SAR had made too many decisions that should be left to the standard drafting team. To address these concerns, the SAR has been revised to remove what was perceived as prescriptive language.

- References to the Year #5 plan requirement were removed from the SAR and TPL and other standards that could be revised under the SAR were explicitly added. The VRPC SAR DT removed references to the budgeting process from the SAR.
- The SAR was also revised to state that the whitepaper is a reference document to be considered (rather than reflected) in developing the standards.
- The intent of the SAR has been clarified by removing the "how to" examples from the body of the SAR. These examples are contained in the whitepaper. Elements from FERC order 693 have been incorporated into the SAR while the whitepaper is provided as a reference document to be considered in the development of standards.
- We have removed the Transmission Planning Reactive Cluster (TPRC) terminology from the SAR. However, coordination is still required among neighboring PCs/TPs and other functional entities within their footprints and the revised SAR provides guidance on what must be included in this coordination, including a peer review process.
- The SAR was also revised to state that the standard drafting team should consider including a requirement for the Transmission Operator (TOP) and Reliability Coordinator (RC) to monitor and take action if reactive power or voltage falls outside identified limits.
- Some concerns were expressed that duplicate requirements (that may already exist in other standards) may be developed within the VAR standards. To address this concern, we have added the TPL standards as standards which may be revised under this SAR.
- The future VRPC Standard Drafting Team (SDT), using the standard development process, will determine the technical details of the VAR Standard requirements, and may also make recommendations to change unclear or implicit requirements in other existing Standards such as MOD, FAC, TPL, TOP and EOP.

Organization	Question 6 Comment
IRC Standards Review Committee	(1) We believe the SAR drafting team has already made too many decisions that should be left up to the standards drafting team. As an example, the SAR is not clear why a five year reactive power and voltage plan is needed? Why is four years or three not good enough? Does a time threshold even need to be established or could this be left up to the Transmission Planner and Planning Coordinator? Why are the existing TPL standards or the proposed TPL standards not sufficient to address reactive power planning? Couldn't this SAR drafting team simply provide input to the drafting team working on TPL standards and, thus, obviate the need for a separate reactive power plan? And how about expanding the existing FAC standards to ensure reactive requirements are included in the determination of SOLs and IROLs to address reactive power availability for the nearer terms. In other words, we agree with the SAR proponent that there is a need to identify reactive power needs in planning and stipulate reactive power requirements in operations planning to ensure reliability. However, we feel that the way to accomplish this is not through the development of a new VAR standard (or expand the existing VAR standards). Rather, this should be accomplished by stipulating the necessary requirements/conditions in the TPL standards and the FAC standards. (2) Appendix 5 of the whitepaper proposes to require many of the entities such as the GO to "budget facilities" in the five year plan. The EPAct of 2005 specifically prohibited the requirement to build additional facilities. It is not clear how a GO could be obligated to "budget facilities" then. (3) The combination of the SAR and the whitepaper lead us to believe that this standard has a strong potential to become prescriptive, if it were to be developed. We caution the drafting team to develop requirements that describe "what" needs to be accomplished and not "how" to accomplish it. Otherwise, registered entities will be restricted from innovating creative new solutions. (4) It is not clear why any reactive power and voltage requirements on GO and GOP requirements are not already addressed in interconnection agreements with the Transmission Operator, any additional requirements for generator owner/operator should be addressed in the appropriate MOD standards. FAC-001 already requires the Transmission Owner to document, maintain and publish facility interconnection requirements and make them available to the Regional Entities and NERC for their inspection. Presumably, if there was some deficiency, the Compliance Monitors would have already notified the Transmission Owner to correct the deficiencies. (5) We strongly caution the SAR drafting team to reconsider the concept of Transmission Planning Reactive Clusters (TPRC). Transmission Planners should be obligated to coordinate with their neighbors through their Planning Coordinator but they should not be obligated to jointly plan their reactive power needs based on some cluster created by a standard unless they so desire. NERC Rules of Procedure already allow multiple entities to join together to meet the standards through Joint Registration. We believe the TPRC will just cause confusion. (6) The examples from Appendix 7 are interesting but we caution the drafting team to be sure they do not create requirements to perform reactive planning in these ways. While they appear to be excellent examples, they certainly each represent one way to meet reactive planning needs and should not become the "how".

Organization	Question 6 Comment
Response: The VRPC SAR DT thanks you for your comment. (1) We have removed the Year #5 plan requirement and revised the SAR to be less prescriptive. We have added the TPL and other standards as standards that could be revised under the SAR. **(2) The VRPC SAR DT removed references to the budgeting process from the SAR. The whitepaper is a reference document to be considered in developing the standards.** **(3) The intent of the SAR has been clarified by removing the "how to" examples from the body of the SAR. These examples are contained in the whitepaper. Elements from FERC order 693 have been incorporated into the SAR while the whitepaper is provided as a reference document to be considered in the development of standards.** **(4) While Interconnection Agreements may contain reactive power and voltage requirements, these are not NERC reliability standards. There may be a reliability need to have GO/GOP requirements as well as for other functional entities under this SAR. The standard drafting team will establish requirements using the NERC Standards Development process.** **(5) We have removed the Transmission Planning Reactive Cluster (TPRC) terminology from the SAR. However, coordination is still required among neighboring PCs/TPs and other functional entities within the PC's footprint.** **(6) The VRPC SAR and reference whitepaper does not require 'how' it must be done. The whitepaper Appendix 7 examples are provided to show that implementation is feasible. The functional entities involved can decide "how" they will implement the VAR Standard requirements. The whitepaper is a reference document to be considered in developing the standards.**	
Electric Market Policy	6.1.3 Planning Documentation and Operations Review Cycle "We do not agree that the TPRC should deliver the VAR Plan to its associated Reliability Coordinator (RC) each year. We could agree with a requirement for an annual review and/or distribution to the RC if there are changes to the VAR Plan. 6.2 Topics which must be covered - While we conceptually agree with "The automatic control system portion of the VAR Plan should include the Normal Steady State automatic control schedules for key transmission bus, distribution delivery point, and generator buses. At a minimum these documented schedules should balance the Normal Steady State demand among reactive resources to maintain an appropriate system voltage profile and reactive power flow for that specific system." Dominion's experience has been that static schedules and profiles need to allow flexibility to accommodate daily/hourly changes while allowing the TOP and RC to maintain dynamic reactive reserves through, for example, changing voltage schedules at some facilities (generators/substations) to insure dynamic reactive reserves are spread among resources. Also we have some concerns with FERC's recommendation to "Include controllable load among the reactive resources to satisfy reactive requirements" Although we agree in principle, but we have doubt that customers are willing to be curtailed to maintain voltage. Dominion's experience with water heater controls indicates customers are willing to be curtailed when done very sporadically, but not on a regular basis. This means that any reliability standard developed to foster demand response (whether for voltage, capacity, energy or any other electric product) should insure that customers can't opt out unless the underlying entity (DP, TOP, TSP) has provisions or margin that requires replacement customers be acquired before existing customers be allowed to terminate participation in

Organization	Question 6 Comment
	programs. It is not sufficient just to have planned and installed necessary reactive resources. A specific emphasis should be placed on reactive resources being available in operating arena if and when the need arises. A case in point is a generator may be capable of supplying certain amount of reactive power in support of the grid voltages if it is operated at its rated power factor. However, if that unit is operated such that its MW output is close to its MVA rating (i.e. operated at or near unity power factor) during normal system operation, it cannot provide dynamic reactive support if a contingency happens to occur during that time. Requiring a generator to operate at its rated power factor in order to keep reactive power reserve in the unit for any possible contingencies is not a good utility practice.
Response: The VRPC SAR DT thanks you for your comment. The whitepaper is a reference document to be considered in developing the standards. The standard drafting team will establish requirements using the NERC Standards Development process.	
MRO NERC Standards Review Subcommittee	FERC order 672 indicated a standard should be clear and unambiguous. A standard should focus on what is required and not how this can be accomplished. The TIS "Reactive Support & Control Whitepaper" is prescriptive and is more focused on the "how" rather than the "what".
Response: The VRPC SAR DT thanks you for your comment. The whitepaper is a reference document to be considered in developing the standards. The standard drafting team will establish requirements using the NERC Standards Development process.	
Xcel Energy	In general, we have concerns that the VAR standard may duplicate requirements already identified in the TPL standards with respect to assessing outages of reactive resources and voltage stability. The SDT needs to ensure that no requirements are duplicated nor "double jeopardy" situations are created. The TPL standards should be considered in the table of "Related Standards" within the SAR.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards which may be revised under this SAR. The future VRPC Standard Drafting Team (SDT), using the standards development process, will determine the technical details of the VAR Standard requirements, and will also make recommendations to change unclear or implicit requirements in other existing Standards such as MOD, FAC, TPL, TOP and EOP.	
Calpine Corporation	In instances where Transmission Owners (TO's) have provided Generator Operators with a Reactive Power schedule, these schedules must be provided to the functional entities responsible for determining reactive power requirements. Dynamic studies must be performed with a constant reactive power output from the generating facilities who have been given Reactive Power schedules. While it's true that VAR-002-1_1b R1 requires that the voltage regulator be operated in automatic voltage control mode and it will respond appropriately to a disturbance, it's also true that VAR-002-1_1b R2 requires that the Generator Operator maintain the voltage or Reactive Power output directed by the Transmission Operator. This will result in the Generator Operator adjusting the voltage regulator to maintain Reactive Power output per the Reactive Power schedule provided by the Transmission Operator, overriding the action of the automatic voltage

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	regulator. This is de facto var control, i.e. adjusting the AVR's voltage setpoint to maintain the Reactive Power output defined in the schedule. If studies are not performed recognizing this fact, they will not accurately reflect the dynamic reactive response of the system and could result in insufficient reactive resources. A similar situation was found in the west regarding the interaction of governors and load controllers on generators. Prior to modeling the load controllers in the dynamic studies, results were overly optimistic in predicting system response. Once the load controllers were modeled, simulation results matched actual system performance much more closely. Similarly, if system reactive studies assume all AVR's are operating in voltage control, but fail to recognize that some may be adjusted to maintain a Reactive Power schedule, study results will not be accurate.
Response: The VRPC SAR DT thanks you for your comment. We will forward your comments to the standard drafting team for their consideration.	
We Energies	In Section 8.5.7, Page 29 of the white paper, it states under Generation Units that "generators within this TPRC should be capable of any voltage not more than 5% above or below nameplate rating." Response: The operating range of 5% above to 5% below nameplate rating should not be a requirement imposed on the generator. There may be other factors in the generating station electrical auxiliary system which can prevent the generator from operating at these limits, especially the lower voltage limit. For example, auxiliary bus voltage limitations may not allow the generator to operate at 5% below rated generator voltage. These limitations are recognized in NERC Standard MOD-025.
Response: The VRPC SAR DT thanks you for your comment. The whitepaper is a reference document to be considered in developing the standards. The future VRPC Standard Drafting Team (SDT) will determine the technical details of the VAR Standard requirements, and will also make recommendations to change unclear or implicit requirements in other existing Standards such as MOD, FAC, TPL, TOP and EOP.	
Southern Company	It is recommended that the criteria for Levels of non-compliance for VAR-002 be reviewed/revised. The current criteria are almost impossible to meet from a practical stand-point. For example, Level 1 non-compliance with Requirement R3 is a single event which the GOP fails to notify the TOP of an AVR or PSS out of service or a change in reactive capability. The problems with this level of restriction are: 1. AVR's and/or PSS's are rarely taken out-of-service and thus the potential for missing a single event is very high since they are not routine. 2. In general a single AVR or PSS outage will not expose the BES to any problems. 3. The criteria do not recognize the size or importance of the units. As written, failing to report an AVR out of service on a 25 MVA unit is weighted the same as failing to report an outage on an 800 MVA unit. Criteria that recognize the overall impact to the reliability of the BES should be considered. One possible measure might be based on a percentage of event hours over the total number of hours the GOP's fleet of units were in-service. Another factor that could be considered is if the unit/plant is a critical asset or not.

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Response: The VRPC SAR DT thanks you for your comment. Please note that the "levels of non-compliance" were replaced with "violation severity levels," however the failure to notify the Transmission Operator is still considered a "Severe" violation severity level. Violation Risk Factors assess the potential impact to reliability if there is noncompliance with the requirement – violation severity levels assess the degree to which the performance was noncompliant without consideration of reliability impact. The Violation Risk Factor for VAR-002, R3 is "Medium". Any penalty associated with noncompliance considers the Violation Risk Factor, the Violation Severity Level and several other factors. A complete discussion of these factors can be found in the Sanction Guidelines. The future VRPC Standard Drafting Team (SDT) will determine the details of the VAR-002 Standard requirements, and will work with NERC staff in proposing associated VRFs and VSLs.	
Manitoba Hydro	Manitoba Hydro believes the VAR standard should focus on reactive power issues in the real-time operational time frame and the TPL standards should focus on planning for adequate reactive power in the planning horizon. In the White paper, WECC has given an example of a transient voltage dip criteria for dynamic reactive power planning. The MRO has done the same thing (TPL-503-MRO-02). The regions should establish appropriate transient voltage deviation limits. TPL-001 is currently under development. This standard requires the TP/PC to ensure the system is adequately planned to meet performance criteria under credible contingencies with a variety of sensitivity assumptions. However, the standard could be modified to require documentation of the reactive power planning criteria (steady-state and dynamic) as well as the reactive power planning margins (e.g. from a PV or QV analysis).Manitoba Hydro does not believe the establishment of a special TPRC is necessary. TPs and PCs already cooperate and coordinate in their studies. Some dynamic reactive power devices (generators/synchronous condensers) often offer the system strengthening through low sub transient reactance when the system is experiencing transients. This is an additional support to maintain the system voltages at desired levels. Although often not obvious, this is a key reason why synchronous condensers are better devices for voltage control at HVdc terminals. This can be a very important part of voltage control especially as the HVdc systems and wind schemes keep penetrating the interconnected system. The TIS "Reactive Support & Control Whitepaper" is focused on the "how" rather than the "what". A standard should focus on what is required as opposed to how this can be accomplished.
Response: The VRPC SAR DT thanks you for your comment. The SAR has been revised to use language that is less prescriptive and we have removed language relating to the "cluster" concept. The whitepaper is a reference document to be considered in developing the standards. The standard drafting team will establish requirements using the NERC Standards Development process.	
Duke Energy	NERC's Reliability Standards Development Procedure points out that the SAR should be heavy on purpose and scope. This SAR is overly prescriptive and seems to have pre-determined outcomes that should instead be left to the Standard Drafting Team. We have strong misgivings about the concept of Transmission Planning Reactive Clusters (TPRC). We do regional studies already and this looks like re-inventing the wheel.
Response: The VRPC SAR DT thanks you for your comment. The SAR has been revised to use language that is less prescriptive and we have removed language relating to the "cluster" concept. The whitepaper is a reference document to be considered in developing the standards. The standard drafting	

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team will establish requirements using the NERC Standards Development process.	
SCE&G	None
RRI Energy Inc	The current draft of VAR-001-1a allows a TOP to only provide a reactive schedule to the generator while the generator must maintain the AVR in the voltage control mode. R4 of VAR-001-1a states: Each Transmission Operator shall specify a voltage or Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator. The Transmission Operator shall provide the voltage or Reactive Power schedule to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage).If the generator is required to keep the AVR in the auto voltage mode then the TOP should be required to provide a voltage schedule. If the generator must control to a reactive schedule with the AVR in the voltage control mode then the generator operator must be constantly adjusting the AVR setting to control to constant VAR's. This practice is not the best practice for reliable operation of the grid. Doesn't this increase the potential for a voltage collapse? The generator should be allowed to operate the AVR in the mode that matches the schedule provided by the TOP.
Response: The VRPC SAR DT thanks you for your comment. We will forward your comments to the standard drafting team for their consideration.	
SERC Planning Standards Subcommittee	The last sentence of the 3rd paragraph of the Detailed Description section of the SAR should be revised to: "The criteria must clearly define what voltage limits are used and define how voltage instability will be avoided under normal and emergency conditions." The criteria do not specify how much reactive resources are needed. Applying the criteria will determine how much. The comments expressed herein represent a consensus of the views of the above named members of the SERC Planning Standards Subcommittee only and should not be construed as the position of SERC Reliability Corporation, its board or its officers.
Response: The VRPC SAR DT thanks you for your comment. The SAR has been revised relating to this. The FERC directive is now listed in the "Industry Need" section of the SAR: Order 693 directed the ERO [paragraph 1868] "to modify VAR-001-1 to include more detailed and definitive requirements on "established limits" and "sufficient reactive resources" and identify acceptable margins (i.e. voltage and/or reactive power margins) above voltage instability points to prevent voltage instability and to ensure reliable operations." **The sentence and paragraph that you reference have been revised as well:** FERC Order 693 directed the ERO to modify VAR-001 to include more detailed and definitive requirements on "established limits" and "sufficient reactive resources" and identify acceptable margins (i.e. voltage and/or reactive power margins) above voltage instability points to prevent voltage instability and to ensure reliable operations. The criteria must clearly define what voltage limits are used and how voltage instability will be avoided under normal and emergency conditions as defined by NERC Reliability Standards.	

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The future VRPC Standard Drafting Team (SDT) will determine the technical details of the VAR Standard requirements, and will also make recommendations to change unclear or implicit requirements in other existing Standards.	
Bonneville Power Administration	The NERC SAR comment form does not distinguish between the NERC Reactive Support and Control Whitepaper and the NERC Reliability Standards Workplan (RSWP) 2009-2011. The NERC RSWP clearly states that this is a 'new' project that would include industry discussion on the setting on specific reserves at the regional level (i.e., vs. a North American standard). The RSWP incorporates concepts that would be applied during the operations, operations-planning and planning time horizons. Given the distinctions in the NERC RSWP, a new VAR standard addressing the planning horizon would be appropriate and modifications to the operational time periods in the existing VAR standards. To try and include planning info in the current VAR standards would weaken them.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards which may be revised under the SAR.	
US Bureau of Reclamation	The process discussed in the white paper for long term reactive planning should be rolled into Project 2006-02 or into a new project. Those projects could draw from the FERC February 2005 Staff Report "Principles for Efficient and Reliable Reactive Power Supply and Consumption" and ensure the market impacts are properly accounted for. The long term planning requirements could then address the reactive source implications of new generation technologies as well as modeling issues related to reactive capacity and foregone generation. These planning requirements would develop specific requirements related to the planning process rather than the resources needs that may be developed through planning.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards which may be revised under the SAR.	
Arizona Public Service Co.	The question on how often to do the study and evaluation should be need based and who should do it should left for the drafting team to decide.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to remove language that was unduly prescriptive. The whitepaper is a reference document to be considered in developing the standards. The standard drafting team will establish requirements using the NERC Standards Development process.	
US Army Corps of Engineers, Northwestern Division	The requirement for long term reactive planning should be covered in a separate Reliability Standard and should not mandate how the system is developed but should guide how the system is developed. The decision of infrastructure enhancements based on planning time frame studies should be driven by market needs and not driven by a Reliability Standard. If the enhancements recommended by the long range planning studies are not built, then the operation of the grid will be constrained and market players will have to live with the constraints. Reliability Standards are for reliable operation of the BES in the operational timeframe.

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Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards which may be revised under the SAR.	
Entergy	The SAR does not address the coordination of the reactive power requirements/voltage schedules between the neighboring systems/utilities. This coordination is important and should be addressed in the SAR.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to include a coordination process (see "Detailed Description"): In addition to establishing reactive planning criteria, the standards should require a *reactive power support and control plan ('VAR Plan').* The neighboring PCs/TPs should review and coordinate plans developed by the functional entities involved. This includes functional entity local plans for reactive power support and control to maintain local system reliability and avoid permanent damage to equipment. The RCs, TOPs and other functional entities associated with a neighboring PC/TP's footprint should review and comment, as they deem necessary, on the PC/TP's criteria and *VAR Plan*. This review cycle should continue on an annual basis.	
ITC Holdings	The white paper describes the need for a 5 year and 1 year voltage and reactive power plan. The VAR standards do not seem like the appropriate place to incorporate "system planning" exercises. The more appropriate place to require such plans would be the Transmission Planning (TPL) standards since their focus is system planning. The SAR and white paper need to define what it means for a system to be voltage stable. Order 693 directed the ERO to include detailed and definitive requirements while identifying acceptable margins above voltage instability points. The Order also put in requirements to perform voltage stability analysis to assist real-time operations in areas susceptible to voltage instability. There are numerous references to the term "voltage stability", but no clear definition of what it means to be voltage stable. Without this definition it will be unclear to the functional entities if they are meeting what we believe is the objective of Order 693 in avoiding "voltage instability". There is no mention in the SAR or white paper of the impact that integrating large amounts of wind generators has on the BES in regards to voltage stability. The expansion of the transmission system in order to accommodate the numerous amounts of wind energy is probably the largest growing contributor to voltage instability, primarily due to the lack of dynamic reactive control they introduce. With older base loaded generators being retired and sometimes replaced with wind generators, the BES's ability to respond dynamically to voltage disturbances and the overall inertia of the power system are being greatly reduced. Will any future modifications to the VAR standards address the impact of integrating wind or any other renewable energy into the BES in regards to voltage stability? Does the ERO acknowledge any difference from a reactive power control perspective between wind and other renewable generators and traditional synchronous generators?
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL standards as standards which may be revised under the SAR. The Standard drafting team will be responsible for drafting and proposing requirements and definitions for voltage stability. Integration of wind and other renewable resources are issues for the standard drafting team to address.	

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FirstEnergy Corp	This project was identified by NERC in their proposed 2010-2012 work plan as "requiring close coordination and joint development with NAESB." The draft SAR does not appear to discuss this coordination. We suggest the SAR team consider the need for NAESB involvement and include in the SAR if deemed necessary.
Response: The VRPC SAR DT thanks you for your comment. NAESB has a representative who is assigned to this project and is on the SAR DT e-mail list.	
Independent Electricity System Operator	We agree with the SAR proponent that there is a need to identify reactive power needs in planning and stipulate reactive power requirements in operations planning to ensure reliability. However, we feel that the way to accomplish this is not through the development of a VAR standard (or expand the existing VAR standards). Rather, this should be accomplished by stipulating the necessary requirements/conditions in the TPL standards and the FAC standards.
Response: The VRPC SAR DT thanks you for your comment. We have added the TPL and other standards as standards which may be revised under the SAR.	
American Transmission Company	We are concerned that the SAR speaks to implementing a number of the concepts in the whitepaper that prescribe “how” to accomplish various voltage and reactive power resource objectives, rather than better identifying “what” needs to be required. It has not been demonstrated that the formation of Transmission Planning Reactive Clusters, Five-Year VAR Plans, Local Automatic and Manual Control designs, System Bus Voltage Collapse Controls, and Reactive Energy Conservation Plans have been successfully applied and would assure better system reliability.It would be crucial to identify what level of static and dynamic reactive power support ill be provided and should be expected from Generation resources and for Distribution loads in order to know what kind and amount of Transmission reactive power resources are need to assure adequate voltage levels and stability.
Response: The VRPC SAR DT thanks you for your comment. We have revised the SAR to remove the cluster concept and the 5 year VAR Plan. We also revised the SAR to remove prescriptive language and the whitepaper is a reference document to be considered by the standard drafting team.	
Midwest ISO Standards Collaborators	1 We believe the SAR drafting team has already made too many decisions that should be left up to the standards drafting team. As an example, the SAR is not clear why a five year reactive power and voltage plan is needed? Why is four years or three not good enough? Does a time threshold even need to be established or could this be left up to the Transmission Planner and Planning Coordinator? Why are the existing TPL standards or the proposed TPL standards not sufficient to address reactive power planning? Couldn’t this SAR drafting team simply provide input to the drafting team working on TPL standards and, thus, obviate the need for a separate reactive power plan? 2 Appendix 5 of the whitepaper proposes to require many of the entities such as the GO to “budget facilities” in the five year plan. The EPAct of 2005 specifically prohibited the requirement to build additional facilities. It is not clear how a GO

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	could be obligated to "budget facilities" then. 3 The combination of the SAR and the whitepaper lead us to believe that this standard has a strong potential to become prescriptive. We caution the drafting team to develop requirements that describe "what" needs to be accomplished and not "how" to accomplish it. Otherwise, registered entities will be restricted from innovating creative new solutions. 4 It is not clear why any reactive power and voltage requirements on GO and GOP requirements are not already addressed in interconnection agreements with the Transmission Operator. FAC-001 already requires the Transmission Owner to document, maintain and publish facility interconnection requirements and make them available to the Regional Entities and NERC for their inspection. Presumably, if there was some deficiency, the Compliance Monitors would have already notified the Transmission Owner to correct the deficiencies. 5 We strongly caution the SAR drafting team to reconsider the concept of Transmission Planning Reactive Clusters (TPRC). Transmission Planners should be obligated to coordinate with their neighbors through their Planning Coordinator but they should not be obligated to jointly plan their reactive power needs based on some cluster created by a standard unless they so desire. NERC Rules of Procedure already allow multiple entities to join together to meet the standards through Joint Registration. We believe the TPRC will just cause confusion. 6 The examples from Appendix 7 are interesting but we caution the drafting team to be sure they do not create requirements to perform reactive planning in these ways. While they appear to be excellent examples, they certainly each represent one way to meet reactive planning needs and should not become the "how".
Response: The VRPC SAR DT thanks you for your comment. (1) We have removed the Year #5 plan requirement and revised the SAR to be less prescriptive. We have added the TPL and other standards as standards that could be revised under the SAR. **(2) The VRPC SAR DT removed references to the budgeting process from the SAR. The whitepaper is a reference document to be considered in developing the standards.** **(3) The intent of the SAR has been clarified by removing the "how to" examples from the body of the SAR. These examples are contained in the whitepaper. Elements from FERC order 693 have been incorporated into the SAR while the whitepaper is provided as a reference document to be considered in the development of standards.** **(4) While Interconnection Agreements may contain reactive power and voltage requirements, these are not NERC reliability standards. There may be a reliability need to have GO/GOP requirements as well as requirements for other functional entities under this SAR. The standard drafting team will establish requirements using the NERC Standards Development process.** **(5) We have removed the Transmission Planning Reactive Cluster (TPRC) terminology from the SAR. However, coordination is still required among neighboring PC/TPs and other functional entities within their footprint.** **(6) The VRPC SAR and reference whitepaper do not require 'how' it must be done. The whitepaper Appendix 7 examples are provided to show that implementation is feasible. The functional entities involved can decide "how" they will implement the VAR Standard requirements. The whitepaper is a**	

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reference document to be considered in developing the standards.	