Comment Report

Project Name:	2016-EPR-02 Enhanced Periodic Review of VAR Standards | Template for VAR-001-4.1
Comment Period Start Date:	2/28/2017
Comment Period End Date:	4/13/2017
Associated Ballots:	

There were 30 sets of responses, including comments from approximately 94 different people from approximately 77 companies representing 10 of the Industry Segments as shown in the table on the following pages.

Questions

1. VAR-001-4.1 Requirement R4, regarding exemptions and exempted units, does not require periodic reviews or reviews triggered by changes; such as, technology, system conditions or other factors. Does this create an impact to reliability? If yes, please explain.

2. If the voltage schedule issued by the TOP to the GOP (Requirement R5) results in a generating unit routinely running at maximum limits, does a lack of dynamic reactive reserve have a reliability impact?

3. As of April 1, 2017, there will no longer be any explicit requirements for monitoring or ensuring adequate reactive reserves. Absent of any explicit requirements to monitor or ensure adequate reactive reserves within the IRO, TOP, or VAR standards, is there an impact to reliability? If yes, please explain.

4. As VAR-001-4.1 Requirement R5, Part 5.2 is silent with regards to a time duration that a generator can be outside of voltage schedule before notification is required. If the TOP is not required to specify the timing portion of the notification requirements while maintaining the necessary flexibility, is there an impact to reliability? If yes, please explain.

5. VAR-001-4.1 Requirement R5 does not include the RC as a recipient of voltage or Reactive Power schedules issued to generators. Is there an impact to reliability? If yes, please explain.

6. VAR-001-4.1 Requirement R5 dictates the status of an AVR. Does the lack of a similar requirement to identify the initial state of the PSS impact reliability? If yes, please explain.

7. The continent-wide VAR standards do not address external control loops to the AVR that may impact the reactive response of a generator. Some external control loops do not have the purpose of automative voltage control, therefore, is there a need to coordinate external loops to prevent an impact to reliability?[1] If yes, please explain.

[1] See also: Lesson Learned, Generator Distributed Control System Impact on Automatic Voltage Regulators, June 9, 2015, (http://www.nerc.com/pa/rrm/ea/Lessons Learned Document Library/LL20150602_Generator_Distributed_Control_System_Impact_on_Automatic_Voltage_Regulators.pdf)

8. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-001-4.1 template. If you disagree with any of the observations, please list the reference number when providing comment.

9. There are a number of other observations in Attachment 5 of the VAR-001-4.1 template that could enhance the standard, but would require a drafting team to develop for industry feedback. If you have any comments about these, please list the reference number when providing comment.

10. The team did not identify a concern related to cost effectiveness as drafted. Do you agree? If not, please provide additional detail.

11. Given the items identified by the periodic review team in the VAR-001-4.1 template, do you agree that the Reliability Standard is sufficient to protect reliability and meet the reliability objective of the standard and does not need immediate modification through standards development; however, there may be a future opportunity to improve any non-substantive or insignificant quality and content issues? If you have any other comments on this review that you haven't already mentioned above, please provide them here.

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
ACES Power Marketing	Brian Van Gheem	6	NA - Not Applicable	ACES Standards Collaborators	Shari Heino	Brazos Electric Power Cooperative, Inc.	1,5	Texas RE
					Tara Lightner	Sunflower Electric Power Corporation	1	SPP RE
					Greg Froehling	Rayburn Country Electric Cooperative, Inc.	3	SPP RE
					Bob Solomon	Hoosier Energy Rural Electric Cooperative, Inc.	1	RF
					Mark Ringhausen	Mark Ringhausen	3,4	SERC
					John Shaver	Arizona Electric Power Cooperative, Inc.	1	WECC
					Bill Hutchison	Southern Illinois Power Cooperative	1	SERC
					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Ginger Mercier	Prairie Power, Inc.	1,3	SERC
Duke Energy	Colby Bellville	1,3,5,6	FRCC,RF,SERC	Duke Energy	Doug Hils	Duke Energy	1	RF
					Lee Schuster	Duke Energy	3	FRCC
					Dale Goodwine	Duke Energy	5	SERC
					Greg Cecil	Duke Energy	6	RF
New York Independent	Gregory Campoli	2		ISO/RTO Standards	Gregory Campoli	NYISO	2	NPCC
					Ben Li	IESO	2	NPCC

System Operator				Review Committee	Kathleen Goodman	ISONO	2	NPCC
					Mark Holman	PJM	2	NPCC
					Charles Yeung	SPP	2	SPP RE
					Terry Bilke	MISO	2	MRO
					Nathan Bigbee	ERCOT	2	Texas RE
					Ali Miremadi	CAISO	2	WECC
Entergy	Julie Hall	6		Entergy/NERC Compliance	Oliver Burke	Entergy - Entergy Services, Inc.	1	SERC
					Jaclyn Massey	Entergy - Entergy Services, Inc.	5	SERC
DTE Energy - Detroit Edison Company	Karie Barczak	3,4,5		DTE Energy - DTE Electric	Jeffrey Depriest	DTE Energy - DTE Electric	5	RF
					Daniel Herring	DTE Energy - DTE Electric	4	RF
					Karie Barczak	DTE Energy - DTE Electric	3	RF
Southern Company - Southern Company Services, Inc.	Pamela Hunter	1,3,5,6	SERC	Southern Company	Katherine Prewitt	Southern Company Services, Inc.	1	SERC
					R. Scott Moore	Alabama Power Company	3	SERC
					William D. Shultz	Southern Company Generation	5	SERC
					Jennifer G. Sykes	Southern Company Generation and Energy Marketing	6	SERC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7,8,9,10	NPCC	RSC no ISO-NE	Paul Malozewski	Hydro One.	1	NPCC
					Guy Zito	Northeast Power Coordinating Council	NA - Not Applicable	NPCC
					Randy MacDonald	New Brunswick Power	2	NPCC

Wayne Sipperly	New York Power Authority	4	NPCC
Glen Smith	Entergy Services	4	NPCC
Brian Robinson	Utility Services	5	NPCC
Bruce Metruck	New York Power Authority	6	NPCC
Alan Adamson	New York State Reliability Council	7	NPCC
Edward Bedder	Orange & Rockland Utilities	1	NPCC
David Burke	Orange & Rockland Utilities	3	NPCC
Michele Tondalo	UI	1	NPCC
Sylvain Clermont	Hydro Quebec	1	NPCC
Si Truc Phan	Hydro Quebec	2	NPCC
Helen Lainis	IESO	2	NPCC
Laura Mcleod	NB Power	1	NPCC
MIchael Forte	Con Edison	1	NPCC
Kelly Silver	Con Edison	3	NPCC
Peter Yost	Con Edison	4	NPCC
Brian O'Boyle	Con Edison	5	NPCC
Greg Campoli	NY-ISO	2	NPCC
Michael Schiavone	National Grid	1	NPCC
Michael Jones	National Grid	3	NPCC
David Ramkalawan	Ontario Power Generation Inc.	5	NPCC
Quintin Lee	Eversource Energy	1	NPCC

					Silvia Mitchell	NextEra Energy - Florida Power and Light Co.	6	NPCC
					Sean Bodkin	Dominion Resources Services, Inc.	4	NPCC
Southwest Power Pool, Inc. (RTO)	Shannon Mickens	2	SPP RE	SPP Standards Review Group	Shannon Mickens	Southwest Power Pool Inc.	2	SPP RE
					Jim Nail	City of Independence, Power and Light Department	5	SPP RE
					John Allen	City Utilities of Springfield, Missouri	4	SPP RE
					Kevin Giles	Westar Energy	1	SPP RE
					mike kidwell	Empire District Electric Company	1,3,5	SPP RE
					Tara Lightner	Sunflower Electric Power Corporation	1	SPP RE
					Don Schmit	Nebraska Public Power District	5	SPP RE
					J.Scott Williams	City Utilities of Springfleld	1,4	SPP RE

1. VAR-001-4.1 Requirement R4, regarding exemptions and exempted units, does not require periodic reviews or reviews triggered by changes; such as, technology, system conditions or other factors. Does this create an impact to reliability? If yes, please explain.

Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC

Answer	No
Document Name	

Comment

BPA does not exempt any qualified units.

Likes 0	
Dislikes 0	

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer	No
Document Name	

Comment

Not necessarily. Generally speaking, IAs and Operating Agreements usually contain language that requires notifications between the GO and TO/TSP/TOP and vice-versa when there are changes. That would serve as the prompt to re-evaluate. Even absent the aforementioned prompt to re-evaluate, nothing precludes the TOP from re-evaluating exemptions.

Likes 0	
Dislikes 0	

Response

Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF

Answer	No
Document Name	

Comment

This sounds like an improvement in theory but it would manifest as a documentation requirement and add little value. A requirement would likely be met by showing an annual review of a procedure containing the exemption criteria.

Likes 0	
Dislikes 0	

Response

Chris Scanlon - Exelon - 1,3,5,6

Answer	No
Document Name	

Comment

There is no need for an administrative requirement to conduct a periodic review.

Likes 0	
Dislikes 0	

Response

Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE

Answer	No
Document Name	

Comment

The exemption should be based on the system need. Operating experience will bring to light when an exeption needs to be reconsidered. There is no need to create a requirement to perform a review.

Likes 0	
Dislikes 0	

Response

Russel Mountjoy - Midwest Reliability Organization - 10

Answer	No
Document Name	

Comment
There are 30 minute system evaluations, next day analysis and other operation studies being run that would highlight if this were an issue. See Reliability Standards – TOP-001-3 & TOP-002-4.

Likes 0	
Dislikes 0	

Response

Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy

Answer	No
Document Name	

Comment
Duke Energy does not believe a periodic review or a review triggered by the specified changes is necessary, and does not believe that the lack of a requirement impacts reliability.

Likes 0	
Dislikes 0	

Response

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators

Answer	No
Document Name	

Comment
TOPs already assess operations that would impact reliability through various Real Time Assessments and Operational Planning Analyses, as required in NERC Reliability Standards TOP-001-3 and TOP-002-4. We feel introducing a requirement for a periodic review of these exemptions would only cause confusion.

Likes 0	
Dislikes 0	

Response

Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2

Answer	No
Document Name	
Comment	
ERCOT agrees that TOPs should periodically review any exemptions provided along with the criteria for granting such exemptions, but it is not necessary to require that through a standard. If a unit's exemption is causing reliability issues, the symptoms will more likely be observed in Planning Assessments, Operational Planning Analysis, and Real Time Assessments. This will prompt either Corrective Actions Plans or Operating Plans to be developed to address.	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	

Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	No
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	

Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	

Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5	
Answer	Yes
Document Name	
Comment	
There should be a requirement to conduct a periodic review to the units that are exempt, at a minimum of every three years of the exemption criteria. In addition, the specified voltage schedule supplied to the unit should be reviewed as well. For example, the initial stages of a wind farm project may not require a specific voltage schedule (i.e. exempt), but as the project progresses, changes (perhaps driven by a proposed increase in the size of the wind farm), a voltage schedule may need to be developed.	
Likes 0	
Dislikes 0	
Response	

Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Agree that there is a gap there. The review could be periodic or trigger based such as an equipment modification or any change that could impact the exempted status.	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	Yes
Document Name	
Comment	
Exemptions and exemption units should be required to ensure statuses have been updated to and from TOP and GOP on a predetermined periodic schedule.	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	Yes
Document Name	
Comment	
Texas RE recommends periodic reviews of exemptions. In order to determine the best actions to support the reliability of the grid, TOPs need to understand the status or capability of available resources. When a generating unit becomes exempt, the TOP loses visibility to that generator.	
Likes 0	
Dislikes 0	

Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	
Comment	
Reclamation asserts it is prudent to apply a time period for the TOP to review their specific criteria for generator exemptions. Reclamation asserts that the logical time period would coincide with the time period specified in the NERC system modeling (MOD) standards. Reclamation suggests Requirement R4 should specify that at least once every 10 years the Transmission Operator shall review and evaluate its exemption criteria for generators and notify pertinent Generator Operators of any changes to the previous criteria.	
Likes 0	
Dislikes 0	
Response	
John Seelke - LS Power Transmission, LLC - 1	
Answer	
Document Name	LS Power Transmission Comments Project 2016-EPR 04.13,17.docx
Comment	
LS Power Transmission's comments address a problem wth **both** and are therefore separately attached..	
Likes 0	
Dislikes 0	
Response	

2. If the voltage schedule issued by the TOP to the GOP (Requirement R5) results in a generating unit routinely running at maximum limits, does a lack of dynamic reactive reserve have a reliability impact?

Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2

Answer	No
Document Name	

Comment

A lack of dynamic reactive reserves on only a single unit will not typically have a reliability impact. However, multiple generating units in the same reactive zone all running at Qmax or Qmin limits while using their dynamic reactive capability to provide that response could have a reliability impact. If seen ahead of time, or if monitored in real time with voltage stability applications, voltage stability System Operating Limits can be established to monitor when it would become a reliability impact. Voltage Schedules should be optimized to use static reactive devices first in order to maximize availability of generating unit dynamic reactive capability. While this is best practice, ERCOT does not necessarily agree that this should be captured in a standard

Likes 0	
Dislikes 0	

Response

Michael Godbout - Hydro-Qu?bec TransEnergie - 1 - NPCC

Answer	No
Document Name	

Comment

Not necessarily. A specific unit running at maximum doesn not mean there is a lack of dynamic reactive reserve.

Likes 0	
Dislikes 0	

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group

Answer	No
Document Name	

Comment

The SPP Review Group has the perspective that a single generating unit is not a concern, because voltage control is a wider area issue involving multiple generator resources. However, if the drafting team feels that the focus of this project extends beyond the single generator, we recommend the drafting team revise the project language to reflect those concerns.

Likes 0	
Dislikes 0	

Response

Russel Mountjoy - Midwest Reliability Organization - 10

Answer	No
Document Name	

Comment

TOP's have the responsibility to ensure adequate dynamic reactive response. From the TOP perspective, reliability impact depends on available resources for the area and dynamic response available for the TOP footprint.

Likes 0	
Dislikes 0	

Response

Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE

Answer	No
Document Name	

Comment

Not necessarily. This would have to be studied to determine whether there is a reliability impact. Planning studies should identify areas that lack sufficient reactive capability. If there are, system modifications should be proposed.

Likes 0	
Dislikes 0	

Response

Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6

Answer	No

Document Name	
Comment	
This question is not clear.	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	
Comment	
Not necessarily - this cannot be generally answered. A single unit in an entire interconnect running at it maximum limits should not have an adverse reliability impact. If something like this occurs routinely, it could indicate the need for an overall review of reactive planning in the area. However, the described behavior of the generating unit could be in line with the overall reactive plan for that area.	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	
Any impact on the system would be highly dependent on the specific system characteristics as well as the specific unit characteristics. A large unit near a critical interface has more impact than a small unit attached to a very strong network. This issue should not be addressed in a continent wide reliability standard.	
Likes 0	
Dislikes 0	
Response	

Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	No
Document Name	
Comment	
Any impact on the system would be highly dependent on the specific system characteristics as well as the specific unit characteristics. A large unit near a critical interface has more impact than a small unit attached to a very strong network. This issue should not be addressed in a continent wide reliability standard.	
Likes 0	
Dislikes 0	
Response	
Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	

Comment	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	
Comment	
Reclamation asserts there are serveral variables to consider. Reclamation considers routinely operating all generating units at the maximum limits to be an undesirable practice because it removes available reactive margin to respond to a grid event. The TOP, as the entity with the area-wide purview, should be aware of other available equipment (for adequate reactive reserves), and would need the flexibility to develop voltage schedules accordingly. If System design limits dictate the need for a voltage schedule which requires routinely running the generating units at maximum limits, the design should be modified to allow units to have more reactive reserve capability.	
Likes 0	
Dislikes 0	
Response	
Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	Yes
Document Name	
Comment	
The question is ambiguous and does not provide sufficient background regarding the system's current conditions and configurations for proper context. Furthermore, the question assumes that the generator is the sole source for reactive reserves in the local region. However, we believe TOP-required Real Time Assessments and Operational Planning Analyses, as well as annual TP-required Planning Assessments, would already identify areas where additional infrastructure would be necessary to address potential voltage and reactive reserves issues.	
Likes 0	
Dislikes 0	
Response	

Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	Yes
Document Name	
Comment	
Generation routinely running at maximum reactive output is an indicator of insufficient reactive infrastructure support in the surrounding system. Voltage collapse or voltage degradation can result in load loss or equipment damage. Planning studies should encompass periodic corrections for inductive load growth.	
Likes 0	
Dislikes 0	
Response	

Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	Yes
Document Name	
Comment	
In a circumstance where numerous generators (not specified within the question) were operating at their VAR limits there would be potential for some impact on the reliability of the system. The systems, capability to react to an event would render the local area with the highest risk.	
Likes 0	
Dislikes 0	
Response	

Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
This would impact reliability, which is why we do not operate this way.	
Likes 0	
Dislikes 0	

Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
BPA believes it depends on whether the voltage schedule would place the whole plant or multiple plants under stress. The wide area risk would not be significant for a single unit operating at reactive limits.	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Entergy expressed concerns that there is not a feedback loop between the TOP and GOP to raise concerns for issues with the voltage schedule – this should be allowed by the standard. If a generating unit is struggling ot meet its voltage schedule, it would also not have margin left for dynamic reserves.	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	Yes
Document Name	
Comment	

If additional reactive is needed for BES operation, the generator will not be able to assist in suppling additional reactive. If the generator is routinely running at maximum limits, system upgrades need to be performed such as installation of additional capacitiors. This should be addressed with the TOP yearly review of the Voltage Schedules.

Likes 0	
Dislikes 0	

Response

Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6

Answer	Yes
Document Name	

Comment

A lack of dynamic reactive reserves could have a reliability impact if the TOP system is depending upon the generator to provide VAR support during transients to maintain reliability. However, the TOPs study work should identify this condition in advance.

Likes 0	
Dislikes 0	

Response

Thomas Foltz - AEP - 3,5

Answer	Yes
Document Name	

Comment

While a potential lack of dynamic reserves for a single unit may not have far-reaching impacts, a wide-scale lack of dynamic reserves could very well have an impact on reliability. Voltage schedules should be developed to allow a unit to have dynamic reserves available under normal conditions to respond to contingencies or disturbances. If a unit is hitting limits on reactive capability, the GOP and TOP should work together to resolve the issue (for example, voltage schedule change, exemptions, GSU tap changes, auxiliary transformer tap changes, etc.).

Likes 0	
Dislikes 0	

Response

Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	
Answer	
Document Name	
Comment	
We do not fully understand the question since the term “lack of dynamic reactive reserve” needs to be clarified wrt whether it means: **a. Lack of dynamic reactive reserve capability?** **b. Lack of dynamic reactive reserve requirements?** **c. Both** **Not knowing the exact meaning of the term, we are unable to provide relevant comment wrt whether or not the lack of any of the above can have a reliability impact.** **In general, we hold the view that if there are dynamic reactive reserve requirements, then they need to be met by having sufficient dynamic reactive reserve capability. Hence, the lack of dynamic reactive requirements does not have any reliability impact. On the other hand, the lack of dynamic reactive reserve capability may have a reliability impact; it depends on whether or not there are any dynamic reactive reserve requirements.** **Footnote: ERCOT does not support the joint response provided.**	
Likes 0	
Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	

Document Name	
Comment	
Difficult to answer at the unit level. A reasonable presumption is that if a unit is always at the max point then the unit is not able to supply dynamic support but the TOP is in a position to know if that is a concern.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	
Document Name	
Comment	
Maybe, this is very situational. The TOP would need the discretion to decide what is best for the system for each situation.	
Likes 0	
Dislikes 0	
Response	

3. As of April 1, 2017, there will no longer be any explicit requirements for monitoring or ensuring adequate reactive reserves. Absent of any explicit requirements to monitor or ensure adequate reactive reserves within the IRO, TOP, or VAR standards, is there an impact to reliability? If yes, please explain.

Preston Walker - PJM Interconnection, L.L.C. - 2 - RF

Answer	No
Document Name	

Comment

The absence of an explicit requirement to monitor reactive reserves does not create a reliability gap.

The IRO suite of standards requires the RC to perform Operational Analyses and Real-time Assessments to prevent instability, uncontrolled separation, or Cascading and to ensure prompt action to prevent or mitigate instances of exceeding Interconnection Reliability Operating Limits (IROLs).

The TOP suite of standards requires the TOP to perform Operational Analyses and Real-time Assessments to prevent instability, uncontrolled separation, or Cascading and to ensure prompt action to prevent or mitigate instances of exceeding System Operating limits SOLs).

Likes 0	
Dislikes 0	

Response

Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6

Answer	No
Document Name	

Comment

The absence of an explicit requirement to monitor reactive reserves does not create a reliability gap.

The IRO suite of standards requires the RC to perform Operational Analyses and Real-time Assessments to prevent instability, uncontrolled separation, or Cascading and to ensure prompt action to prevent or mitigate instances of exceeding Interconnection Reliability Operating Limits (IROLs).

The TOP suite of standards requires the TOP to perform Operational Analyses and Real-time Assessments to prevent instability, uncontrolled separation, or Cascading and to ensure prompt action to prevent or mitigate instances of exceeding System Operating limits SOLs).

Likes 0	
Dislikes 0	

Response

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	
Comment	
No, TPL-001-4 covers this. In addition, reactive reserve requirements are generally specific to each region or locale, and each TOP is best-qualified to determine those requirements within their respective transmission systems.	
Likes 0	
Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	No
Document Name	
Comment	
IRO and TOP standards are sufficient to address this.	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No
Document Name	
Comment	
Monitoring and operations are covered by other NERC Reliaiblity standaads such as TOPs.	
Likes 0	
Dislikes 0	
Response	

Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE	
Answer	No
Document Name	
Comment	
There are requirements to remain within limits post contingency. Operators would be aware of reactive reserve deficiencies if a plan cannot be developed to maintain the system within voltage limits post contingency. See TOP-002-4 R2, TOP-004-2 R1 and TOP-006-2 R3. Therefore monitoring is being done. Additionaly it may be impossible to “ensure” adequate reactive reserves if the planning process did not provide adequate reserves.	
Likes 0	
Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	No
Document Name	
Comment	
Reactive reserves adequacy is addressed in the Real-time and next day Operating studies.	
Likes 0	
Dislikes 0	
Response	
Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	No
Document Name	
Comment	
Duke Energy does not believe that the lack of requirments for monitoring of reactive resources impacts reliability. An effective operator will already be aware of reactive reserves, and adequacy of reactive reserves is covered by Real-time assessments already.	
Likes 0	
Dislikes 0	

Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Document Name	
Comment	
The SPP Review Group agrees with the TOP/IRO mapping document that provides supportive details addressing monitoring adequate reactive reserves in the VAR Standards. However, we recommend that the drafting team include the mapping document in future resource materials to provide clarity on these type of discussions.	
Likes 0	
Dislikes 0	
Response	
Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	No
Document Name	
Comment	
We believe other reliability requirements in place to conduct Real Time Assessments and Operational Planning Analyses already address these concerns.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	No
Document Name	
Comment	
Reclamation supports that the absence of explicit requirements for monitoring or ensuring adequate reactive reserves does not in itself impact reliability; however, the absence of adequate reactive reserves would impact reliability. Reclamation contends that ensuring sufficient var capacity is quite difficult	

outside of requiring AVRs and sufficient amounts of spinning reserve. In order to ensure adequate reactive reserves, Reclamation suggests that an explicit requirement be retained.	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	

Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5	
Answer	Yes
Document Name	
Comment	
From an overall situational awareness point of view, there should be a mechanism to monitor reactive reserve capabilities. While we agree there needs to be an awareness, it is unclear what “adequate” reactive reserves mean. If voltage contingencies in your Real Time Assessment are being monitored, operating plans should be developed for any potential SOL’s. While we believe that there should be a requirement for monitoring reactive reserves, the diversity in the renewable generation mix makes modeling of the reserve units more complex.	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	Yes
Document Name	
Comment	
Reactive reserves must be available to support the reliable operation of the BES. The TOP must be required to know the status of reactive reserves at all times.	
Likes 0	

Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Entergy agrees, monitoring reactive reserves is part of the purpose of this standard but is not addressed by any requirements.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
In lieu of RTCA voltage stablility analysis, BPA believes an explicit requirement for monitoring is necessary.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	Yes
Document Name	
Comment	
One could argue that VAR-001-4.1 R2, the RTA, and the OPA work to ensure adequate reactive reserves. However, there are no requirements for monitoring reactive reserves. For many TOPs, there are not frequent reactive reserve issues. Therefore, it is often not given adequate attention. A lack	

of frequent reactive reserve issues may lead some to discount their importance. Lack of awareness of reactive reserves is a common factor during voltage collapse events. Not requiring that any party monitor reactive reserves (in real-time) impacts relaibilty. Furthermore, the TOP is the appropriate party to monitor reactive reserves. A requirement to monitor reactive reserves would fit well within the VAR-001 standard.	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
With no requirements to monitor or ensure adequate reactive reserves within the IRO, TOP, or VAR standards, there is a risk of falling below adequate resources and not being aware. Were this to occur and an initiating even occurred, it could be too late to acquire such resources.	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	Yes
Document Name	
Comment	
Primary reliance on TO's to accurately report VAR reserves absent a specific requirement could negatively impact accurate knowledge of VAR reserves available on the system and create the potential to impact reliability.	
Likes 0	
Dislikes 0	
Response	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	

Answer	Yes
Document Name	
Comment	
MVAR or Reactive reserves should be monitored to ensure pre and post contingency voltage stability. With many entities having real time / online voltage stability monitoring tools, MVAR reserves can be monitored in terms of MW flows along an interface. So, if all reactive zones are either monitored via real time / next day voltage stability limit calculating tools (i.e. an SOL exists for each zone) OR thermal constraints (Facility Ratings) are always more limiting than Voltage stability limits, then it would not impact reliability. OPA and RTA is predicated on evaluation for SOL exceedances, so if there is not an SOL that represents a reactive zone/area, then there is potential for voltage stability issues if MVAR reserves is not monitored in its stead. Voltage instability and reactive reserve deficiencies were contributing causes to the 2003 Northeast Blackout.	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	
Document Name	
Comment	
N/A	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE is concerned the entity will have too much leeway in determining its reactive reserves. TOPs need to understand its voltage levels. The TOPs need to have the ability to accurately assess current voltage control capability in order to take proper action during abnormal voltage conditions.	
Likes 0	
Dislikes 0	

Response

4. As VAR-001-4.1 Requirement R5, Part 5.2 is silent with regards to a time duration that a generator can be outside of voltage schedule before notification is required. If the TOP is not required to specify the timing portion of the notification requirements while maintaining the necessary flexibility, is there an impact to reliability? If yes, please explain.

Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2

Answer	No
Document Name	

Comment

TOP-003 already provides a mechanism for TOPs to notify GOPs of duration requirements.

Likes 0	
Dislikes 0	

Response

Richard Jackson - U.S. Bureau of Reclamation - 1,5

Answer	No
Document Name	

Comment

Reclamation asserts it is appropriate to allow the TOP to determine whether to specify a timing portion of the notification requirement.

Likes 0	
Dislikes 0	

Response

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators

Answer	No
Document Name	

Comment

The question is ambiguous. The TOP is already required to specify a duration when a GOP deviates outside the required range or tolerance band. We assume the question asks how soon after the initial deviation occurs that the GOP must notify the TOP. If so, we believe System Operators who

monitor the BES will likely be notified by EMS alarms first for significant deviations causing a reliability impact. For other deviations, the TOP has followed best practices and established a notification requirement for the GOP, as part of the timing duration requirement.	
Likes 0	
Dislikes 0	
Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Document Name	
Comment	
We have no concerns that the TOP notification to the GOP doesn't contain a timing limit for the generator in Part 5.2 of the standard. The TOP's responsibility to provide the GOP with notification requirements would reasonably include the timing of such notifications.	
Likes 0	
Dislikes 0	
Response	
Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	No
Document Name	
Comment	
Duke Energy does not believe that the absence of a requirement outlining a time duration that a generator can be outside of the voltage schedule before notification is required presents a clear impact to reliability. From a reliability standpoint, there are already standards that require the TOP to monitor SOL limits. In doing so, a TOP would be notified based on monitoring of SOL(s) whether a GOP sent notification or not. We believe this mitigates any potential issue pertaining to reliability of the system. We do feel that additional guidance around this topic may be useful to industry stakeholders in the form of a guidelines and technical basis section.	
Likes 0	
Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	

Answer	No
Document Name	
Comment	
Requirement 5.2 states that the TOP provides the GOP with the notification requirements for deviations from the voltage schedule.	
Likes 0	
Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE	
Answer	No
Document Name	
Comment	
No, the TOP is aware of real time and post contingency voltages and whether the system is or will be within limits. If the system is not or will not be within limits the TOP can call the generator to inquire the status of the AVR or their ability to control to the reactive schedule.	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	No
Document Name	
Comment	
While the requirement does not specify a timing requirement it is likely implemented in practice. For FirstEnergy, PJM manuals document the notification requirement for when a generator is outside of its voltage schedule and a timing aspect is included. The standard should not mandate a specific time, however, it could generally indicate that the notification must specify an expected timing for the notification.	
Likes 0	
Dislikes 0	
Response	

Chris Scanlon - Exelon - 1,3,5,6	
Answer	No
Document Name	
Comment	
We don't believe this has a significant reliability impact, This should be left to the discretion of the TOP and can be detailed in the voltage schedule issued to the GOP if the TOP requires it.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	No
Document Name	
Comment	
Relibility may not be affected, but a timing duration that a generator can be outside of a schedule before notification is required can significantly reduce compliance risk for the GOP. This compliance risk does not align with an improvement to reliability. It would be reasonable for NERC to require the TOP specify a time duration before a notification is required by the GOP.	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	
Comment	
Not necessarily - the TOP has the flexiblity to specify the time frame for any required notification where they determine that timing is critical. R5.2 of VAR-001-4.1 is sufficient as it is.	
Likes 0	

Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	No
Document Name	
Comment	
If BPA dispatch specified a deviation from the voltage or reactive schedule, it would include a projected time frame. This is considered an Operating Instruction in accordance with COM-002-4.	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	No
Document Name	
Comment	
There is not an impact to reliability but this issue needs to be addressed for compliance monitoring. The GOP must know how long the voltage can be outside the generator bus schedule. This will assist the auditor when reviewing compliance and assist the GOP in knowing when a self report is required.	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5	
Answer	No
Document Name	
Comment	

While there may be no significant impact to reliability, not specifying the duration that a unit can be outside the specified band could result in communication issues. For example, this could potentially result in excessive phone calls which could be distracting to both the GOP and TOP. Perhaps the language in the requirement could be changed to suggest examples of what can be included in the notification requirement from the TOP to the GOP.

Likes 0	
Dislikes 0	

Response

Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6

Answer	No
Document Name	

Comment

Likes 0	
Dislikes 0	

Response

Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee

Answer	No
Document Name	

Comment

Likes 0	
Dislikes 0	

Response

Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE

Answer	No
Document Name	

Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	

Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
If the TOP is not required to specify the timing portion of notifying them of a generator being outside of the voltage schedule and VAR-002 does not specify such timing for notification, a generator could be outside of the TOP's provided voltage schedule an indefinite amount of time. We believe that it is obvious that this could have an impact to reliability. Currently the voltage schedule is an hourly average, however, this has nothing to do with notification. Currently the schedule that we send only indicates, "All such notices to the TOS shall be without intentional delay." If there is no stipulation in 5.2, we envision some GOPs will insist that they have no requirement for notification.	
Likes 0	
Dislikes 0	
Response	

Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Agree that the timing portion should be required to be specified by the TOP. Do not agree that this parameter should be prescriptively defined by NERC.	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
: Texas is concerned that if there is no timing requirement, there is no control in place to ensure the generator's reactive schedule is reset back to normal, which could mean an entity could be out of its voltage schedule indefinitely. Texas RE frequently recommends entities provide timing in notifications so expectations are set.	
Likes 0	
Dislikes 0	
Response	

5. VAR-001-4.1 Requirement R5 does not include the RC as a recipient of voltage or Reactive Power schedules issued to generators. Is there an impact to reliability? If yes, please explain.

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC

Answer	No
Document Name	

Comment

Provided within a timeframe specified by the RC upon request would be adequate.

Likes 0	
Dislikes 0	

Response

Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric

Answer	No
Document Name	

Comment

Voltage control is a local issue. The TOP, GOP and DP must be aware and concerned with voltage control. The RC is looking a higher level and at a much larger area where local voltage control should not be a concern.

Likes 0	
Dislikes 0	

Response

Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance

Answer	No
Document Name	

Comment

This is already addressed in IRO-010 and VAR-001 is not the appropriate place to address this. Entergy disagrees with adding this requirement to VAR-001.

Likes 0	

Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	No
Document Name	
Comment	
BPA believes VAR-001-4.1, R1.1 ensures that the RC and adjacent TOP's receive the system voltage schedule on request. BPA believes the IRO-010 data request would be available for the RC to receive the voltage or Reactive Power schedules.	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	
Comment	
R1.1 of VAR-001-4.1 gives the RC the ability to request this information if needed.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	No
Document Name	
Comment	
The RC can specify this as required data in their documented specification for data from IRO-010-2.	
Likes 0	

Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	No
Document Name	
Comment	
The RC has other ways of getting this information.	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No
Document Name	
Comment	
RC is informed as part of IRO-010.	
Likes 0	
Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE	
Answer	No
Document Name	
Comment	
Per R1.1 the RC can obain a copy of the voltage schedule. Therefore the schedules are available to the RC.	
Likes 0	

Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	No
Document Name	
Comment	
The TOP is responsible for system operations and reliability. The RC can specify their data needs per IRO-010-2.	
Likes 0	
Dislikes 0	
Response	
Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	No
Document Name	
Comment	
An RC may already be receiving this information via established agreements with member entities, and can request this information at any time. While having this information may be helpful for the RC, we do not see a real impact to reliability with there not being a requirement to provide the RC with these scehdules.	
Likes 0	
Dislikes 0	
Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Document Name	
Comment	
The review group does not find any reliability impact with the RC not receiving the voltage and Reactive Power schedules from the TOP. However as registered RC, SPP finds the data in the schedules to be very valuable to other processes associated with the RC function. For example, this particular	

data can help increase the accuracy of the network applications as well as the Real-time Assessment. In our review and interpretation of the IRO Standards, it is our understanding that the IRO-010-2 Standard addresses the RC receiving this type of data and eliminating any concerns for reliability issues.	
Likes 0	
Dislikes 0	
Response	
Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	No
Document Name	
Comment	
By its definition, a TOP is the entity responsible for the reliability of its “local” transmission system. The issuance of voltage or Reactive Power schedules to generators should be identified as a “local” reliability concern. We feel the inclusion of the RC as a recipient would be burdensome, particularly when monitoring and assessing the Wide Area view of the BES.	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	
Answer	No
Document Name	
Comment	
NERC currently has IRO Standards that require RC’s to obtain this information.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	No

Document Name	
Comment	
Reclamation proposes the TOP should provide the RC with copies of the voltage or Reactive Power schedules issued to generators so that the RC has the appropriate information for analysis and operations.	
Likes 0	
Dislikes 0	
Response	
Michael Godbout - Hydro-Qu?bec TransEnergie - 1 - NPCC	
Answer	No
Document Name	
Comment	
We support NPCC's comments. That is, requirement 1.1 provides for an mandatory communication of the schedules to the RC upon the RC's request.	
Likes 0	
Dislikes 0	
Response	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	No
Document Name	
Comment	
IRO-010 provides the RC the means to get the desired information, if necessary.	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5	
Answer	Yes
Document Name	
Comment	
The RC is required to monitor SOL's and IROL's. The information in the voltage/reactive power schedules could, at a minimum, be used to improve the RC's awareness. While this could potentially have a positive reliability impact, we do not believe VAR-001 is the proper standard for such an obligation. Rather, we believe IRO-010-2 would be more appropriate.	
Likes 0	
Dislikes 0	

Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
In many cases the RC is the Planning Authority for the TOP. If the RC is not aware of the voltage schedule provided to the generators, this cannot be taken into account for system planning.	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE suggests it would be prudent for the RC to understand its entities' voltage and Reactive Power schedules. Understanding these schedules allow for better planning of reactive resources and, system awareness. Since the RC has the authority to direct dispatch of generation outside of its voltage or reactive power schedule due to real time concerns or contingencies, it should know it is doing so. Knowledge of normal reactive schedules is a primary means by which an RC can realize the extent of reactively deficient areas.	
Likes 0	
Dislikes 0	
Response	

6. VAR-001-4.1 Requirement R5 dictates the status of an AVR. Does the lack of a similar requirement to identify the initial state of the PSS impact reliability? If yes, please explain.

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators

Answer	No
Document Name	

Comment

The question assumes that all generators have a PSS. This is simply not true. For those that do, the GOP is already required to notify the TOP of a PSS status change in Requirement R3 of NERC Standard VAR-002-4. This notification is used to identify what is outside normal operation and could affect a generator's availability.

Likes 0	
Dislikes 0	

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group

Answer	No
Document Name	

Comment

The SPP Review Group has no concerns with the power system stabilizer (PSS) initial state not being mentioned in this particular requirement. After reviewing VAR-001 and VAR-002 Standards, the review group believes that the PSS status change concerns are addressed in VAR-002-4 under Requirement R3 and there are no concerns in reference to reliability issues.

Likes 0	
Dislikes 0	

Response

Russel Mountjoy - Midwest Reliability Organization - 10

Answer	No
Document Name	

Comment

The NSRF acknowledges a potential impact on reliability, but only when there is an identified reliability need per the TPL-001-4 stability analysis. We agree there is a need to know the initial state. However, VAR-002-4 R3 already requires the GOP to notify the TOP of PSS change. The TOP can pursue other avenues via a data specification request (TOP-003-3 and IRO-010-2).	
Likes 0	
Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE	
Answer	No
Document Name	
Comment	
A PSS would only be installed if there was a reliability reason. Presumably when the generator and PSS were commissioned the TOP knew the status. Therefore only notifications of chages to the status are necessary.	
Likes 0	
Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	No
Document Name	
Comment	
A PSS does not function like an AVR, a PSS is typically not enabled automatically until a certain MWe when ramping a unit up in power and subsequently disabled at a certain MWe on ramping a unit down in power. Specifying an initial state may not be meaningful.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	No

Document Name	
Comment	
It may not be wise for the TOP to dictate the PSS status as part of a NERC standard. However, the TOP should be aware of the PSS status. Perhaps, the GOP should be required to tell the TOP the actual and normal PSS status on an annual basis, in additional to real-time notification of status changes.	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	
Comment	
PSS requirements are often already detailed in the interconnection requirements or existing regional requirements. A PSS is typically set up in such a way it would be automatically turned on/off at pre-determined MW setpoints when the AVR is in service. So, with languge on AVR, it will typically also cover the PSS.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	No
Document Name	
Comment	
As BPA is a part of the WECC region, there is already standard VAR-501-WECC-2 with a requirement for PSS to be kept in service.	
Likes 0	
Dislikes 0	
Response	

Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	No
Document Name	
Comment	
The PSS on many units do not come into service until the unit is on line and loaded to some point. The initial state of the PSS should be considered out of service until documentation provided by the GOP states when the PSS comes into service. Once that point is obtained, the PSS should be considered in service unless notied other wise by the GOP.	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
The PSS status information does not meaningfully impact the TOP.	
Likes 0	
Dislikes 0	
Response	
Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	No

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	Yes
Document Name	
Comment	
There are instances where the PSS will have an impact on IROL Limits. PSS desired states should be determined for each generator. ERCOT has Protocols that identify the necessary coordination. While this is a best practice, ERCOT sees no need to codify this in a standard.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	
Comment	
Reclamation contends both AVR and PSS should be addressed in both VAR-001-4.1 and VAR-002-4. The lack of including PSS creates the need to address PSS in regional variances to ensure grid stability. Reclamation asserts that it is important for PSSs to be required as applicable.	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	
Answer	Yes
Document Name	
Comment	
Impacts on the system would be highly dependent on the specific system characteristics as well as the specific unit characteristics, however There can be instances where the PSS will have an impact on IROL Limits.	
Likes 0	

Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	Yes
Document Name	
Comment	
Texas RE recommends a similar requirement for the PSS. Understanding the PSS availability gives a broader view of the system and its ability to damp out instability. While the PSS is not a reactive resource (it is a real power resource), studies should provide input on which assumptions concerning PSS were used, and whether there should be PSS in-service requirements for regional generation. If determined dynamically necessary, enough PSSs must be in service regionally to provide the necessary oscillatory damping.	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
In many cases system stability is greatly altered with a PSS out of service. Therefore the initial state of the PSS is very important and should be stipulated. PSS is normally fixed in the firmware of the generator and cannot be changed or altered. If a unit is designed such that the initial state of the PSS will be “on” when the unit is first synchronized, that this information can be shared with the TOP in a ONE TIME notification which will inform the TOP that the PSS is always on, unless notified. It is essential that the TOP know the state of the PSS but if the design “forces” the PSS to be on unless otherwise “switched” off and the “switch off” entails notice, then the TOP would know the status.	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes

Document Name	
Comment	
Agree that clarity is needed, but this should appear in VAR-002 R1, not related to VAR-001 R5. Disagree with putting this content in VAR-001.	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 3,5	
Answer	Yes
Document Name	
Comment	
While Power System Stabilizers are not used on all generating units, a requirement to inform the TOP of the initial state of the PSS may be beneficial for those instances where they *are* used. That being said, since a Power System Stabilizer does not regulate voltage or reactive power, and, instead, is used to dampen electro-mechanical oscillations, references to Power System Stabilizers should not be added to VAR-001. In addition, consideration might also be given to removing PSS references from VAR-002 as well. It may be worth considering that requirements relating to PSS operation and status be placed in a different standard or technical guide; otherwise, the scope of these standards should be expanded to encompass PSS operation and status.	
Likes 0	
Dislikes 0	
Response	

7. The continent-wide VAR standards do not address external control loops to the AVR that may impact the reactive response of a generator. Some external control loops do not have the purpose of automative voltage control, therefore, is there a need to coordinate external loops to prevent an impact to reliability?[1] If yes, please explain.

[1] See also: Lesson Learned, Generator Distributed Control System Impact on Automatic Voltage Regulators, June 9, 2015, (http://www.nerc.com/pa/rrm/ea/Lessons Learned Document Library/LL20150602_Generator_Distributed_Control_System_Impact_on_Automatic_Voltage_Regulators.pdf)

Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	No
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	No
Document Name	
Comment	
The "how" of meeting the specifications of the TOP is not the TOP's job to define. This may be a lessons learned to consider these factors in your "net" response. This should be results based and not method determinate.	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	No
Document Name	

Comment
Not necessarily - it depends - at the high speed response level (the inverter) most DGR sites do not employ voltage control - most run in reactive control or PF control. They respond to commands from the outer loop plant voltage control. The external (plant wide) control loops are slower in response time to what is traditionally considered to be used for system transient voltage conditions. The external loops can assist with ensuring that the voltage schedule is followed.

Likes 0	
Dislikes 0	

Response

Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy

Answer	No
Document Name	

Comment
While external control loops can provide an unintended impact to reliability we do not believe that VAR-001 is the correct standard to address identifying and correcting these deficiencies. We believe MOD-025 or MOD-026 would be a more appropriate standard to identify the need to document and communicate the impact of external control loop actions on the AVR to the TOP.

Likes 0	
Dislikes 0	

Response

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group

Answer	No
Document Name	

Comment
The SPP Review Group has no concerns with control loops not being mentioned in this particular requirement as well as seeing no reliability issues. The status change of the alternative voltage controlling device (control loops) has been addressed in the VAR-002-4 Standard under Requirement R3.

Likes 0	
Dislikes 0	

Response

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	No
Document Name	
Comment	
We do not believe there is a need to require coordination of external loops. Though we thank the Periodic Review Team for reaffirming the importance of this documented NERC lesson learned, we disagree that the occurrence of this singularity necessitates a NERC enforceable requirement. This would set a precedence for all future NERC Lesson Learned and undermine the intent of that program.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	No
Document Name	
Comment	
Reclamation contends that VAR-001-4.1 should require external control loops to be coordinated.	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	

Comment	
Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE	
Answer	No
Document Name	
Comment	
Likes 0	

Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
There are external control loops, like VAR regulators and power factor controllers, that can over-ride action of generator's Automatic Voltage Regulator. The action of such controls is one of the contributing factors to the August 10, 1996 Western Interconnection power outage. BPA believes if language were to be included in a Standard revision, it would need to be carefully drafted as it may become too prescriptive, requiring expensive equipment replacements.	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	Yes
Document Name	
Comment	
Both GOP and TOP need to understand how a generator is going to control voltage. Requiring that the GOP understand and document any external control schemes lends itself to improving reliability.	

Likes 0	
Dislikes 0	

Response

David Jendras - Ameren - Ameren Services - 1,3,6

Answer	Yes
Document Name	

Comment

If the AVR response is altered due to external control loops, this needs to be taken into account. The purpose of VAR-001 in its entirety is for the TOP to understand the VAR resources available from each generator. If the resource availability is altered due to something other than automatic voltage control, the TOP needs to be aware of it and also have the latitude to request removal of the loop if it is not for the protection of the unit, transmission system or equipment on which either is dependent.

AVR is required to operate in auto if not a notification is required per VAR-002.

We are concerned that even though the AVR could stay in auto, an external control loop might impact the reactive response of the generator. We believe that this could, in effect, defeat the purpose of the AVR to control the voltage as mandated.

Likes 0	
Dislikes 0	

Response

Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee

Answer	Yes
Document Name	

Comment

If there are external controls loops that could override the AVR and limit the reactive output, some level of coordination or notification should be required. Plant owners need to be diligent that external control loops do not counteract the primary function of excitation or governor control.

Likes 0	
Dislikes 0	

Response

Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2

Answer	Yes
Document Name	
Comment	
If there are external controls loops that could override the AVR and limit the reactive output, some level of coordination or notification is appropriate. However, this does not necessarily require modification to a standard.	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	
Document Name	
Comment	
N/A	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE recommends external control loops (for example, PSS) that have an affect on AVR operations should be considered in planning studies to alleviate impacts to reliability.	
Likes 0	
Dislikes 0	
Response	

8. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-001-4.1 template. If you disagree with any of the observations, please list the reference number when providing comment.

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators

Answer	
Document Name	

Comment

We agree with the errata list and thank the Periodic Review Team for identifying these administrative type observations.

Likes 0	
Dislikes 0	

Response

Richard Jackson - U.S. Bureau of Reclamation - 1,5

Answer	
Document Name	

Comment

Reclamation agrees with the proposed errata.

Likes 0	
Dislikes 0	

Response

Russel Mountjoy - Midwest Reliability Organization - 10

Answer	
Document Name	

Comment

The NSRF agrees with the review team.

Likes 0	
Dislikes 0	

Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE recommends using the latest Results Based Standards template for VAR-001. Texas RE noticed R4 starts with “The Transmission Operator…” but the R4 Measure says “Each Transmission Operator…”	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	
Document Name	
Comment	
No comment.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	

Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	
Document Name	
Comment	
2.4 Reactive Power Schedule should be defined and included the “which could include” statement one time and not repeated throughout the document. It impairs readability.	
Likes 0	
Dislikes 0	
Response	

9. There are a number of other observations in Attachment 5 of the VAR-001-4.1 template that could enhance the standard, but would require a drafting team to develop for industry feedback. If you have any comments about these, please list the reference number when providing comment.

Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	
Document Name	
Comment	

1.1 Disagree, these are separate actions by separate functional entities and need to be required independently. Could reword to say "…in automatic control mode as specified by the TOP".

2.1 Entergy does not find this unclear – is this a frequently violated or misunderstood requirement in the industry?

2.2 Disagree - don't see this as an action that will improve reliability. This seems like an administrative or business practice that is out of scope of the standard.

2.3 agree

2.4 disagree. the transmission operators are already tasked with maintaining the reliability of the BES in their interconnection by detailed means.

2.5 Recommend solving this issue with a glossary term, as commented above. Avoid excess noisy verbiage in the requirements that might cause confusion and impair readability.

3.1 Agree, see comments above.

4.1 and 4.2 - Disagree, would like to see "assess and schedule" added to R2 to make the wording more robust.

4.3 Agree - - term "instruct" should be used consistently throughout the standards (it is an Operating Instruction).

4.5 Agree, change to "all applicable" or "all non-exempt" also applies to part 1 of R5 severe VSL

4.6 Agree, Severe is for missing all of the applicable GOPs, High would be for missing 1 or more of non-exempt GOPs.

4.7 and 4.8 Agree

4.9 We agree that this information is important and needs to be considered, but feel that dynamic voltage schedules need to be developed into a new/separate requirement (new R6) and make the original R6 into R7.

5.1 agree

5.2 agree, recommend to go with "instruct" consistently in this and other standards. (see reasoning above)

5.3 Agree - TOP should coordinate with the "GSU Owner" rather than trying to specify any Functional Entity.

9.1 Not necessary for clarity - is this a highly violated and misunderstood requirement in industry?

Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	
Document Name	
Comment	
Item 1.1: R5.1 of VAR-001-4.1 is not a GOP requirement, so there is no redundancy with R1 of VAR-002-4. Item 2.2: No additional clarity is needed for R2.2 of VAR-001-4.1 for how a TP determines the exemption criteria needs to be individually decided and not dictated. Item 3.1: It is not necessary to define the terms listed in the article - generator owners and operators are already fully aware of the meaning of the terms. Item 2.4: No additional clarity is needed around coordination of implementing voltage schedules at the same point in time. Transmission Operators are well aware of the system response to changes in voltage schedule and already take that into consideration.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	

Answer	
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	
Document Name	
Comment	
No comment.	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	
Document Name	
Comment	
For #1 in Attachment 5, VAR-002-4 Requirement R1 is not redundant with VAR-001-4.1 Requirement R5 in that it does not specify the location of the monitoring or control. VAR-002-4 Requirement R2, Part 2.3 does stipulate that the GOP must inform the TOP if the location is not the location the TOP required when they provided the voltage schedule. However, it does not allow for approval by the TOP of the methodology for conversion of the schedule. Therefore, the requirement in VAR-001-4.1 Requirement 5 should not be retired.	
Likes 0	
Dislikes 0	
Response	

Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE does not have comments on this question.	
Likes 0	
Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	
Document Name	
Comment	
The review team has highlighted a number of issues that would help with clarification of requirements, however the review team has also indicated that this is not a highly violated standard, is practically implemented and addresses a reliability need.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	
Document Name	
Comment	
Reclamation agrees with the proposed observations.	
Likes 0	
Dislikes 0	
Response	

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	
Document Name	
Comment	
We thank the Periodic Review Team for identifying Paragraph 81 requirements within this standard. However, the team also identified the need for additional requirements. We believe this is a step in the wrong direction for a standard that is not often violated.	
Likes 0	
Dislikes 0	
Response	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	
Document Name	
Comment	
It may be helpful to define the terms “voltage schedules” and “Automatic Voltage Regulators” for the sake of clarity. There has been confusion around the terms “voltage schedules,” “reactive power schedules,” and “voltage limits.” The recent Reactive Power Planning Realibility Guideline has added some clarity to what is a “voltage schedule,” and it seems clear that this is not synonomous with “voltage limits,” but the definition could be clearer than the parentheticals in the requirements R1 and R5 today. Additionally there has been confusion between the voltage schedules in R1 and those mentioned in R5 if they are one and the same or different.	
Likes 0	
Dislikes 0	
Response	
Michael Godbout - Hydro-Qu?bec TransEnergie - 1 - NPCC	
Answer	
Document Name	
Comment	
Attachment 5, point 5.3.	

In the Québec interconnection, a number of step-up transformers are owned by TOs. Standards like FAC-008-3 and PRC-025-1 allow for this reality. This standard does not (R6). We believe that when this standard is revised, this change should be made in order to make the standard consistently applicable.

This same requirement (R6) (and the matching requirements in VAR-002-4) do not seem to be RBS. In particular, they do not specify a performance to be achieved, only a means - tap changes - by which an unspecified goal must be attained. In the Enhanced Periodic Review, some parties stated that such a requirement regarding tap changes was necessary in some regions. Nevertheless, such a requirement currently calls out a single manner of achieving an unnamed goal. Currently, the requirement, as written, causes us no problems. However, when the standard is revised, it should be rewritten to reflect a performance-based approach.

Likes 0	
Dislikes 0	

Response

10. The team did not identify a concern related to cost effectiveness as drafted. Do you agree? If not, please provide additional detail.	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	No
Document Name	
Comment	
Per Question 7 – BPA believes any new requirement would need to be drafted in such a way that the needed functionality can be achieved without requiring the potential for replacing a bevy of equipment.	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	No
Document Name	
Comment	
Without additional information and studies it is difficult to determine cost impacts relative to the reliability benefits provided by the standard.	
Likes 0	
Dislikes 0	
Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	No
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	
Comment	
Reclamation does not have any concerns related to the cost effectiveness of VAR-001-4.1, but asserts that the standard would be more cost-effective after incorporating the above suggestions.	
Likes 0	
Dislikes 0	
Response	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Cost effectiveness is always a concern but should not take precedence over reliability issues.	
Likes 0	
Dislikes 0	
Response	

Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	Yes
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	Yes
Document Name	
Comment	

Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes

Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

11. Given the items identified by the periodic review team in the VAR-001-4.1 template, do you agree that the Reliability Standard is sufficient to protect reliability and meet the reliability objective of the standard and does not need immediate modification through standards development; however, there may be a future opportunity to improve any non-substantive or insignificant quality and content issues? If you have any other comments on this review that you haven't already mentioned above, please provide them here.	
Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF	
Answer	No
Document Name	
Comment	
Due to the lack of a requirement across all the NERC standards for any party to monitor reactive reserves, the VAR-001 standard should be revised to include such a requirement on the TOP. This standard review should be graded as REVISE – RED.	
Likes 0	
Dislikes 0	
Response	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	No
Document Name	
Comment	
ERCOT does believe the Reliability Standard is sufficient to protect reliability and meet the reliability objective of the standard and does not need immediate modification through standards development.	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3,4,5, Group Name DTE Energy - DTE Electric	
Answer	Yes
Document Name	
Comment	

No comments	
Likes 0	
Dislikes 0	
Response	
Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
AZPS recommends a change the Purpose to remove “monitoring” since there are no monitoring requirements.	
Likes 0	
Dislikes 0	
Response	
Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Document Name	
Comment	
No comments	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	Yes
Document Name	
Comment	

All suggested changes found in Attachment 4 of the periodic review are acceptable. The other changes suggested are not needed.

Likes 0	
Dislikes 0	

Response

Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4

Answer	Yes
Document Name	

Comment

While our responses to Q1, Q2 and Q3 suggestion some improvements in the standard may be warranted based on the questions asked, we believe that overall the standard is sufficient. However, if the majority of industry also believes there may be some reliability impact to the items raised in Q1, Q2 and Q3 then NERC may need to further investigate those items through a standards development project.

Likes 0	
Dislikes 0	

Response

Michael Cruz-Montes - CenterPoint Energy Houston Electric, LLC - 1 - Texas RE

Answer	Yes
Document Name	

Comment

CenterPoint Energy believes that the VAR-001-4.1 Standard is sufficient to protect reliability and meet the reliability objective of the standard and does not need immediate modification through standards development. We appreciate the efforts of the review team in identifying potential areas for future improvement to low priority issues.

Likes 0	
Dislikes 0	

Response

Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators

Answer	Yes

Document Name	
Comment	
We thank you for this opportunity to provide these comments.	
Likes 0	
Dislikes 0	
Response	
Richard Jackson - U.S. Bureau of Reclamation - 1,5	
Answer	Yes
Document Name	
Comment	
Reclamation asserts that VAR-001-4.1 should be modified to include the proposed requirements, errata, and observations. Reclamation supports periodic reviews of standards like these as essential, and appreciates the work of the Periodic Review Team.	
Likes 0	
Dislikes 0	
Response	
Michael Godbout - Hydro-Qu?bec TransEnergie - 1 - NPCC	
Answer	Yes
Document Name	
Comment	
The EPR has identified a number of issues. However, most issues identified so far seem relatively minor. We do not see a pressing need to revise the standard at this time. At some point though, the standard will have to be revised and cleaned up though.	
Likes 0	
Dislikes 0	
Response	

Glen Farmer - Avista - Avista Corporation - 1,3,5	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Dennis Chastain - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Preston Walker - PJM Interconnection, L.L.C. - 2 - RF	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6	
Answer	Yes
Document Name	

Comment	
Likes 0	
Dislikes 0	
Response	
Jesus Sammy Alcaraz - Imperial Irrigation District - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
David Jendras - Ameren - Ameren Services - 1,3,6	
Answer	Yes
Document Name	
Comment	
Likes 0	

Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Chris Scanlon - Exelon - 1,3,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	

Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Russel Mountjoy - Midwest Reliability Organization - 10	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Gregory Campoli - New York Independent System Operator - 2, Group Name ISO/RTO Standards Review Committee	
Answer	Yes
Document Name	

Comment	
Likes 0	
Dislikes 0	
Response	
Hien Ho - Tacoma Public Utilities (Tacoma, WA) - 1,3,4,5,6	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	
Document Name	
Comment	
Texas RE frequently encounters wind farms that do not recognize that the technology to maintain voltage is an AVR. Wind Farm Management Systems (under a variety of names) clearly demonstrate the capability to control volatage and are used daily but, because it is not specifically called an “AVR”, entities often miss responsibilities. With the penetration of wind, it is imperative that this get corrected globally, rather than one-off awareness (via an compliance discovery method) or workshops that are not necessarily attended by all parties. Texas RE has done outreach and will continue to do so but would encourage a project to clarify the VAR standards.	
Likes 0	
Dislikes 0	
Response	

Comments received from Leonard Kula of IESO

Questions

1. VAR-001-4.1 Requirement R4, regarding exemptions and exempted units, does not require periodic reviews or reviews triggered by changes; such as, technology, system conditions or other factors. Does this create an impact to reliability? If yes, please explain.

   ☒ Yes
   ☐ No
   Comments:

   The exemption criteria may change due to changes in technology or system conditions, hence if not reviewed, may deem the previously established criteria invalid. A periodic review is necessary to ensure there are no reliability gaps.

2. If the voltage schedule issued by the TOP to the GOP (Requirement R5) results in a generating unit routinely running at maximum limits, does a lack of dynamic reactive reserve have a reliability impact?

   ☐ Yes
   ☐ No
   Comments:

   We do not fully understand the question since the term "lack of dynamic reactive reserve" needs to be clarified wrt whether it means:

   a. Lack of dynamic reactive reserve capability?

   b. Lack of dynamic reactive reserve requirements?

   c. Both

   Not knowing the exact meaning of the term, we are unable to provide relevant comment wrt whether or not the lack of any of the above can have a reliability impact.

   In general, we hold the view that if there are dynamic reactive reserve requirements, then they need to be met by having sufficient dynamic reactive reserve capability. Hence, the lack of dynamic reactive requirements does not have any reliability impact. On the other hand, the lack of dynamic reactive reserve capability may or may not have any reliability impact; it depends on whether or not there are any dynamic reactive reserve requirements.

3. As of April 1, 2017, there will no longer be any explicit requirements for monitoring or ensuring adequate reactive reserves. Absent of any explicit requirements to monitor or ensure adequate reactive reserves within the IRO, TOP, or VAR standards, is there an impact to reliability? If yes, please explain.

   ☐ Yes
   ☒ No
   Comments:

We do not believe that explicit requirements to monitor or ensure adequate reactive reserves are needed. Reactive reserves are needed to support voltage schedule (R2), which in turn supports SOLs and IROLs (R1). The need to monitor and ensure sufficiency of reactive reserve is implicit in meeting Requirements R1 and R2 of VAR-001-4.1.

4. As VAR-001-4.1 Requirement R5, Part 5.2 is silent with regards to a time duration that a generator can be outside of voltage schedule before notification is required. If the TOP is not required to specify the timing portion of the notification requirements while maintaining the necessary flexibility, is there an impact to reliability? If yes, please explain.

   ☐ Yes
   ☐ No

   Comments:

   We assume that the TOP will include in its notification requirement, the time duration that a generator can be outside of voltage schedule before notification is required. Hence we don't believe there is any reliability impact for not having such explicit wording. However, we are indifferent as to whether or not such wording should be added to Part 5.2.

5. VAR-001-4.1 Requirement R5 does not include the RC as a recipient of voltage or Reactive Power schedules issued to generators. Is there an impact to reliability? If yes, please explain.

   ☒ Yes
   ☐ No

   Comments:

   The RC may have a reliability need to be notified the of voltage or Reactive Power schedules issued to generators. The requirement in Part 1.1 only addresses the situation when a request is made by the RC; it not address the situations when the TOP itself develops and conveys the schedule to the GOP. Not having the latter information can have a reliability impact if the RC needs to monitor and ensure adherence to the schedule.

6. VAR-001-4.1 Requirement R5 dictates the status of an AVR. Does the lack of a similar requirement to identify the initial state of the PSS impact reliability? If yes, please explain.

   ☐ Yes
   ☒ No

   Comments:

   We believe that the default assumption is that the PSS is initially in service. A change to this initial status is required in VAR-002 (R3). This should suffice to ensure reliability. That said, we do not oppose strongly to adding an explicit requirement under VAR-001, R5.

7. The continent-wide VAR standards do not address external control loops to the AVR that may impact the reactive response of a generator. Some external control loops do not have the purpose of automative voltage control, therefore, is there a need to coordinate external loops to prevent an impact to reliability?[1] If yes, please explain.

   ☐ Yes
   ☐ No
   Comments:

   Notes to IESO SME: please assess if we have similar set up in Ontario, and provide draft comment accordingly. Please see excerpt from NERC's assessment of the current VAR-001-4.1 (the VAR-001-4.1 template):

   "The WECC variance E.A.18 is specific to external control loops to the manufacturer's AVR control loop. Due to the system configuration of the WECC, it was one of the earlier adopters of AVR and PSS controls. Due to the age of the controls or difficulty with setting reactive droop compensation on some older style controls, external loop controls were implemented from the plant control system. This can be done via DCS or SCADA. Variance E.A.18 requires that if external controls are used, that they do not affect the AVR's transient response during fault conditions. There is a need to determine if this type of control is used outside of the WECC. Adding this variance to the continent wide NERC standard might be justified if other utilities practice this method of voltage control and there have been documented cases that the external control hindered the AVR from responding properly during a fault event."

8. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-001-4.1 template. If you disagree with any of the observations, please list the reference number when providing comment.

   Comments:

   No comment.

9. There are a number of other observations in Attachment 5 of the VAR-001-4.1 template that could enhance the standard, but would require a drafting team to develop for industry feedback. If you have any comments about these, please list the reference number when providing comment.

   Comments:

   We generally agree with the proposed enhancements presented in Attachment 5, but do support developing the definitions for those terms listed under Section 3.1. The VAR-001 standard has been in place for almost 10 years and there have not been many issues with the lack of clarity associated with the terms "generator voltage schedule", "generator Reactive Power schedule, "system voltage schedule," and "automatic voltage regulator (AVR). We not believe that defining them will improve the understanding of the VAR-001 standard. Rather, adding these definitions to the NERC Glossary may prolong the development and approval of the next VAR-001 version, and add unnecessary chore to maintaining the glossary down the road.

[1] See also: Lesson Learned, Generator Distributed Control System Impact on Automatic Voltage Regulators, June 9, 2015, (http://www.nerc.com/pa/rrm/ea/Lessons Learned Document Library/LL20150602_Generator_Distributed_Control_System_Impact_on_Automatic_Voltage_Regulators.pdf)

10. The team did not identify a concern related to cost effectiveness as drafted. Do you agree? If not, please provide additional detail.

☒ Yes
☐ No

Comments:

11. Given the items identified by the periodic review team in the VAR-001-4.1 template, do you agree that the Reliability Standard is sufficient to protect reliability and meet the reliability objective of the standard and does not need immediate modification through standards development; however, there may be a future opportunity to improve any non-substantive or insignificant quality and content issues? If you have any other comments on this review that you haven't already mentioned above, please provide them here.

☒ Yes
☐ No

Comments:

Comments received from John Seelke of LS Power Transmission, LLC

VAR Standards Enhanced Periodic Review (EPR)
Comments of Behalf of LS Power Transmission, LLC (LSPT)

The comments below address an issue with both VAR standards – VAR-001-4.1 and VAR-002-4. While the review team reviewed each standard individually, they did not identify the reliability issue discussed below. Because comments were requested separately for each standard, LSPT's comments do not fit within either standard.

The issue is contradictory language regarding a Transmission Operator's (TOP's) obligations regarding the automatic voltage regulator obligations of its Generator Operators (GOPs). This issue can easily be addressed by the review team.

VAR-001-4.1, in part, is listed below:

R5. Each Transmission Operator shall specify a voltage or Reactive Power schedule (which is either a range or a target value with an associated tolerance band) at either the high voltage side or low voltage side of the generator step-up transformer at the Transmission Operator's discretion. *[Violation Risk Factor: Medium] [Time Horizon: Operations Planning]*

5.1. The Transmission Operator shall provide the voltage or Reactive Power schedule (which is either a range or a target value with an associated tolerance band) to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode (the AVR is in service and controlling voltage).

The highlighted text in 5.1 *requires* the TOP to "direct the Generator Operator to comply with the schedule in automatic voltage control mode (the AVR in service and controlling voltage)." This language should be *deleted* because an AVR's operation is more completely addressed in VAR-002-4, R1.

R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (with its automatic voltage regulator (AVR) in service and controlling voltage) or in a different control mode as instructed by the Transmission Operator unless: 1) the generator is exempted by the Transmission Operator, or 2) the Generator Operator has notified the Transmission Operator of one of the following: *[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]*

- That the generator is being operated in start-up,[1] shutdown,[2] or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or
- That the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, shutdown, or testing.

While the first phrase in R1 *requires* the GOP to "operator each generator…in the automatic voltage control mode (with its automatic voltage regulator (AVR) in service and controlling voltage," the remaining language in R1 describes *exceptions* to this rule. These exceptions require either the TOP's approval or the TOP's notification by its GOP. VAR-002-4, R1 contradicts VAR-001-4.1, part 5.1, because *no* TOP directive to its GOPS is required regarding AVR operation. Furthermore, part 5.1 *does not permit the exceptions* described in R1. Would a TOP that did not direct its GOPs on its AVR operation as required by part 5.1 be non-compliant with part 5.1? That question is moot if the highlighted language in VAR-001-4, part 5.1 were deleted.

Therefore, the language in R1 should be the *only* requirement addressing normal AVR operation. The confusion created highlighted language in VAR-001-4.1, part 5.1 can only have a negative impact on reliability.