

## Consideration of Comments

**Project Name:** 2016-EPR-02 Enhanced Periodic Review of VAR Standards | Template for VAR-002-4

**Comment Period Start Date:** 2/28/2017

**Comment Period End Date:** 4/13/2017

There were 30 sets of responses, including comments from approximately 113 different people from approximately 90 companies representing the 10 Industry Segments as shown in the table on the following pages.

All comments submitted can be reviewed in their original format on the [project page](#).

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Director of Standards Development, [Steve Noess](#) (via email) or at (404) 446-9691.

### Executive Summary

The periodic review team completed a comprehensive review of VAR-002-4 – Generator Operation for Maintaining Network Voltage Schedules. The team found the standard is sufficient to protect reliability and meet the reliability objective of the standard; however, there may be future opportunity to improve a non-substantive or insignificant quality and content issue. Industry comments also affirmed that the standard: 1) is sufficient to protect reliability, 2) meets the reliability objective of the standard, and 3) no immediate revision is necessary. The following are the observations and recommendations of the periodic review team.

## Questions

1. VAR-002-4, Requirement R2, requires the GOP to maintain generator voltage or Reactive Power schedule. Requirement R2, Part 2.3 requires a methodology for converting the voltage to the point being monitored by GOP, as applicable. Is Requirement R2, Part 2.3 necessary as a Requirement or is it sufficient to be a Measure (or technical guidance) of maintaining the voltage or Reactive Power schedule as required by Requirement R2? If yes, please explain.
2. In VAR-002-4 Requirement R3 the GOP notifies the TOP when the AVR status has changed after 30 minutes. There is no requirement for a notification from either the TOP (or GOP) to be submitted to the RC. Is there an impact to reliability? If yes, please explain.
3. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-002-4 template. If you disagree with any of the observations, please list the reference number when providing comment.
4. There are a number of other observations in Attachment 5 of the VAR-002-4 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.
5. The team did not identify a concern related to cost effectiveness as drafted. Do you agree? If not, please provide additional detail.
6. Given the items identified by the periodic review team in the VAR-002-4 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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					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 Hills	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 System Operator	Gregory Campoli	2		ISO/RTO Standards Review Committee	Gregory Campoli	NYISO	2	NPCC
					Ben Li	IESO	2	NPCC
					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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
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	6	SERC

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
						and Energy Marketing		
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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Edward Bedder	Orange & Rockland Utilities	1	NPCC
					David Burke	Orange & Rockland Utilities	3	NPCC
					Michele Tondalo	UI	1	NPCC
					Sylvain Clermont	Hydro Québec	1	NPCC
					Si Truc Phan	Hydro Québec	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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					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
Midwest Reliability Organization	Russel Mountjoy	10		MRO NSRF	Joseph DePoorter	Madison Gas & Electric	3,4,5,6	MRO
					Larry Heckert	Alliant Energy	4	MRO
					Amy Casucelli	Xcel Energy	1,3,5,6	MRO
					Chuck Lawrence	American Transmission Company	1	MRO
					Michael Brytowski	Great River Energy	1,3,5,6	MRO
					Jodi Jensen	Western Area Power Administratino	1,6	MRO



Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Kayleigh Wilkerson	Lincoln Electric System	1,3,5,6	MRO
					Mahmood Safi	Omaha Public Power District	1,3,5,6	MRO
					Brad Parret	Minnesota Power	1,5	MRO
					Terry Harbour	MidAmerican Energy Company	1,3	MRO
					Tom Breene	Wisconsin Public Service	3,5,6	MRO
					Jeremy Volls	Basin Electric Power Coop	1	MRO
					Kevin Lyons	Central Iowa Power Cooperative	1	MRO
					Mike Morrow	Midcontinent Independent System Operator	2	MRO
Dominion - Dominion	Sean Bodkin	3,5,6		Dominion	Connie Lowe	Dominion - Dominion	3	NA - Not Applicable

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
Resources, Inc.						Resources, Inc.		
					Lou Oberski	Dominion - Dominion Resources, Inc.	5	NA - Not Applicable
					Larry Nash	Dominion - Dominion Virginia Power	1	NA - Not Applicable
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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
					Tara Lightner	Sunflower Electric Power Corporation	1	SPP RE
					Don Schmit	Nebraska Public Power District	5	SPP RE
					J.Scott Williams	City Utilities of Springfield	1,4	SPP RE
PPL - Louisville Gas and Electric Co.	Shelby Wade	3,5,6	RF,SERC	Louisville Gas and Electric Company and Kentucky Utilities Company	Charles Freibert	PPL - Louisville Gas and Electric Co.	3	SERC
					Dan Wilson	PPL - Louisville Gas and Electric Co.	5	SERC
					Linn Oelker	PPL - Louisville Gas and Electric Co.	6	SERC

**The Industry Segments are:**

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

**1. VAR-002-4, Requirement R2, requires the GOP to maintain generator voltage or Reactive Power schedule. Requirement R2, Part 2.3 requires a methodology for converting the voltage to the point being monitored by GOP, as applicable. Is Requirement R2, Part 2.3 necessary as a Requirement or is it sufficient to be a Measure (or technical guidance) of maintaining the voltage or Reactive Power schedule as required by Requirement R2? If yes, please explain.**

Thomas Foltz - AEP - 3,5

Answer No

Document Name

Comment

A technical guide in the measure would be sufficient. Generator control is typically from the low side of GSU, and the TOP generator voltage schedule is typically at the BES Point of Interconnection. If a generator does not monitor from the assigned TOP voltage schedule monitoring point, a generator must then have an alternative method to monitor and providing evidence of maintaining voltage schedule.

Likes 0

Dislikes 0

Response

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

Answer No

Document Name

Comment

R2.3 is unnecessary as a Requirement. Voltage information is available when needed.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer** No

**Document Name**

**Comment**

Part 2.3 is not required.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**Jesus Sammy Alcaraz - Imperial Irrigation District - 1**

**Answer** No

**Document Name**

**Comment**

Generator must have a way to know they are meeting TOP voltage schedule requirements. Typicall, TOP monitors generator at point of interconnection. If Gnerator does not have access to this point, then alternate means of monitoring performance on generator side must be provided. A Technical Guide should be adequate.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer**

No

**Document Name**

**Comment**

It is not needed as a sub requirement - the primary objective is for the GOP to follow the schedule, not how it is accomplished.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**Laura Nelson - IDACORP - Idaho Power Company - 1**

<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
R2 requires each GOP to maintain generator voltage.	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).	
<b>Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
A Measure is sufficient.	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment.	
<b>Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF</b>	
<b>Answer</b>	No



<b>Document Name</b>	
<b>Comment</b>	
The NSRF agrees that R2.3 is not necessary. We recommend moving it to technical guidance.	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).	
<b>Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
Duke Energy does not believe that Part 2.3 is necessary as a requirement, and agrees with removing it from the standard altogether.	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).	
<b>Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators</b>	
<b>Answer</b>	No

<b>Document Name</b>	
<b>Comment</b>	
<p>We find the yes-no question confusing with the conjunction “or” present. We believe Requirement R2, Part 2.3 is unnecessary, as the development of a methodology falls under Paragraph 81 criteria, particularly Criterion B3: Documentation. Another possible alternative is the creation of a white paper identifying the methodology necessary to convert a scheduled voltage to a GOP-measurable voltage point.</p>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<p>Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).</p>	
<b>Richard Jackson - U.S. Bureau of Reclamation - 1,5</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
<p>Reclamation asserts that Requirement R2, Part 2.3 is not necessary as a requirement and should be addressed in the technical guidance. Further, some Transmission Operators provide bus voltage but not generator voltage. Reclamation suggests that VAR-002-4 R2 be revised to “...maintain the voltage or Reactive Power schedule provided by the Transmission Operator...”</p>	
Likes 0	
Dislikes 0	
<b>Response</b>	

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**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**

**Thomas Breene - WEC Energy Group, Inc. - 3,4,5,6**

**Answer** No

<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6, Group Name Dominion</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	

**Response**

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

**Answer** Yes

**Document Name**

**Comment**

BPA believes this works as a requirement.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer** Yes

**Document Name**

**Comment**

Yes, the requirement is unreasonable in VAR-002-4 because it places an additional monitoring requirement on the generator that isn't in the spirit of the overall requirement to maintain a voltage schedule. Requirement 2.3 should be worded consistently as a results based requirement by replacing 'monitor' with 'maintain'. Requiring that the GOP consider how to maintain the voltage schedule if the TOP and GOP schedule maintenance point is different supports reliability.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer** Yes

**Document Name**

**Comment**

We believe that it is necessary. However, it should be consistent with VAR-001-4.1 in that it should stipulate that just having the methodology provided to the TOP is not sufficient, it should be approved by the TOP.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer** Yes

**Document Name**

**Comment**

*The Requirement provides necessary flexibility for the GOP in the method of monitoring the voltage. We don't disagree that a measure or guidance would provide a similar result but Exelon does not see any reason to change the requirement.*

(As an aside, the question is confusing, we are answering that the Requirement is necessary. Others may be responding affirmatively to “is it sufficient as a measure”?)

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**Shelby Wade - PPL - Louisville Gas and Electric Co. - 3,5,6 - SERC, Group Name** Louisville Gas and Electric Company and Kentucky Utilities Company

**Answer**

Yes

**Document Name**

**Comment**

Yes, Requirement R2, Part 2.3 is necessary as a Requirement to ensure accuracy and eliminate ambiguity. Requirement R2, Part 2.3 requires a methodology for converting the voltage to the point being monitored by the GOP. The GO monitors the voltage to track compliance within the voltage parameters as specified by the TO. Requiring a conversion methodology ensures that the GO and the TO will communicate to affirm that the voltage being targeted by the GO aligns with the voltage parameters set by the TO. As a Measurement, there is no assurance that the steps necessary to precisely align the GO voltage readings with that of the TO would be taken, resulting in a reactive rather than a proactive approach to voltage control.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer** Yes

**Document Name**

**Comment**

Transmission Operators rely on Generator Operators to maintain voltage at the point of interconnection (or point that the issued voltage schedule is based on). If Generator Operators are monitoring a different point (e.g. low side generator terminals), it may cause confusion with the Transmission Operator. Including this as a requirement, makes the expectation clear.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**David Ramkalawan - Ontario Power Generation Inc. - 5**

**Answer** Yes

**Document Name**

**Comment**

R2 Part 2.3 requires revision to include the following “Generator Operator (GOP) will monitor voltage based on existing equipment at its Facility”, to clarify that it is required to monitor and not just imply that. The requirement should state that the GOP shall monitor the



voltage. How the GOP monitors the voltage is left up to the GOP. Examples of how the monitoring is to be done could be put into the technical guidance.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer**

Yes

**Document Name**

**Comment**

The SPP Review Group recommends that the drafting team leave Part 2.3 associated with Requirement R2. However, we suggest revising the current language associated with Part 2.3 to be consistent with Guideline Technical Basis (GTB).

SPP’s proposed language is as follows:

“Generator Operators that do not monitor the voltage at the location specified in their voltage schedule shall have a methodology for converting the scheduled voltage specified by the Transmission Operator to the voltage level being monitored by the Generator Operator.”

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

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

**Answer**

**Document Name**

**Comment**

This is an "or" question that does not have a yes/no answer as written. In the review document, the concern is that the requirement is not written as performance based. Based on the review document, agree, rewrite R2.3 and M2 to be performance based such as "The Generator Operator shall monitor the voltage specified in the voltage schedule either directly or by a conversion methodology." which takes some of the pressure off of M2 to be the requirement and it can be reworded as well. Needs to be a requirement but rewritten to be effective.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).

**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 with **both** and are therefore separately attached..

Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) addresses the redundancy issue in the Periodic Review Recommendations: VAR-001-4.1 – Voltage and Reactive Control document, Attachment 5: Other Miscellaneous Corrections/Revisions, Item 1.1.	
<b>Rachel Coyne - Texas Reliability Entity, Inc. - 10</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
The requirement set forth in VAR-002-4, R2.3 should be retained. Texas RE has encountered several instances in which generation facilities have monitored voltage at different points than specified by their TOP. For example, voltage monitoring has typically been required at the Point of Interconnection. In several instances, however, generators have monitored voltage at other points on facility site. In several cases, there is a significant distance between these points, resulting in significant variations in voltage levels due to line losses. Without a common, documented conversion methodology, generators may not meet their voltage schedule requirements. Given this experience, Texas RE recommends that this requirement be retained to ensure generators properly satisfy their voltage schedule requirements in the manner intended by the TOP.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. Industry comments affirmed and the periodic review team (PRT) agrees that Requirement R2, Part 2.3 should be considered for removal or modification to be consistent with a results-based (performance, competency, or risk based) standard (i.e., performance, competency, or risk based).	

**2. In VAR-002-4 Requirement R3 the GOP notifies the TOP when the AVR status has changed after 30 minutes. There is no requirement for a notification from either the TOP (or GOP) to be submitted to the RC. Is there an impact to reliability? If yes, please explain.**

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

**Answer** No

**Document Name**

**Comment**

This notification requirement and associated communication can be addressed via IRO-010-2.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its VAR-002-4 Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

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

**Answer** No

**Document Name**

**Comment**

Reclamation asserts the communication between GOPs and TOPs regarding the status of AVR/PSS equipment and VAR capacity is important, and the existing 30 minute time frame for the GOP notification to the TOP is adequate. Reclamation suggests the TOP, having a wider view of the BES, would be the logical entity to analyze the AVR/PSS equipment availability as it applies to the system, and if needed, notify the RC.

Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its VAR-002-4 Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator (RC) to identify and request such information. Therefore, no reliability gap exists.	
<b>Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
By its definition, a TOP is the entity responsible for the reliability of its “local” transmission system. A change in the state of an AVR after 30 minutes should be identified as a “local” reliability concern. We feel the inclusion of notifying the RC would be burdensome, particularly when monitoring and assessing the Wide Area view of the BES.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.	
<b>Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	

The review group does not find any reliability impact with the RC not receiving the notifications from either the GOP or TOP in reference to the AVR status change. However, as registered RC, SPP finds the AVR notification data 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**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**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 reliability is impacted by the lack of notification of AVR status change to the RC. We believe that a notification to the TOP is sufficient, with the TOP having discretion to escalate to the RC if escalation is deemed appropriate by the TOP.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF**

**Answer** No

**Document Name**

**Comment**

The TOP should act as a filter for the RC. One generator AVR out of service may not have a significant reliability impact. The TOP's 30-minute assessment may identify an issue at that time and should notify the RC.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6**

**Answer** No

**Document Name**

**Comment**

The RC is notified as part of the IRO-010 data submission.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

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

**Answer** No

**Document Name**

**Comment**

The RC can get this information from other sources / standards.  
 The Functional Model for the RC has no real time tasks listed for the RC to receive info from a GOP.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**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
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.	
<b>Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
IRO-010-2 gives the RC the ability to request this if it is determined to be needed.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.	
<b>Jesus Sammy Alcaraz - Imperial Irrigation District - 1</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
RC needs to request data via IRO-010.	
Likes	0

Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.	
<b>Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC</b>	
Answer	No
Document Name	
<b>Comment</b>	
BPA believes the impact would be minor for a single unit change in AVR status. BPA believes TOP-001, R9 appears to close the gap on notification to the RC for an AVR status change.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.	
<b>Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance</b>	
Answer	No
Document Name	
<b>Comment</b>	

This requirement is addressed in IRO-010, the RC needs to specify this in their data spec if it is needed and avoid spreading similar data requests across multiple standards.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

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

**Answer** No

**Document Name**

**Comment**

Voltage is a local requirement that impacts the TOP, GOP and DP. Change in AVR status notification is not a high level system impact that the RC should be concerned about.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

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

**Answer** No

<b>Document Name</b>	
<b>Comment</b>	
<p>The requirement to notify within 30 minutes is too stringent and does not have commensurate reliability benefits. Typically after knowing that an AVR is out, the TOP simply makes a note and no action is taken since R2.1 assures that the generator produces the same amount of VAR even in manual voltage control mode. Even if the TOP were to receive this information in 60 to 120 minutes, reliability will not be impacted. The AVR information is not automatically updated in RTCA and hence RTCA results do not change. Unless the TOP and the RC automatically update the real time simulation programs for AVR status, the requirement for notification within 30 minutes does not provide a reliability benefit and places an undue compliance administrative burden. If the Drafting Team thinks otherwise, please provide real system scenario examples where the reliability would have been impacted.</p>	
Likes	0
Dislikes	0
<b>Response</b>	
<p>Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.</p>	
<b>Thomas Breene - WEC Energy Group, Inc. - 3,4,5,6</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
<p>The number of generators and the relative impact to reliability of a limited sub-set reporting AVR status changes would likely not result in useful information to entities without direct operational responsibility for transmission voltage.</p>	
Likes	0
Dislikes	0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

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

**Answer** No

**Document Name**

**Comment**

IRO-010 provides the vehicle for the RC to obtain reliability related information. It is redundant to mandate that the RC receive specific information regardless of its impact on reliability.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**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**

Likes 0

Dislikes 0

<b>Response</b>	
<b>Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Laura Nelson - IDACORP - Idaho Power Company - 1</b>	
<b>Answer</b>	No
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Glen Farmer - Avista - Avista Corporation - 1,3,5</b>	
<b>Answer</b>	No
<b>Document Name</b>	

**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**

IRO 10 provides the vehicle for the RC to obtain reliability related information. It is redundant to mandate that the RC receive specific information regardless of its impact on reliability.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**David Ramkalawan - Ontario Power Generation Inc. - 5**

**Answer**

Yes

**Document Name**

**Comment**

The Reliability Coordinator should receive in real time the AVR & PSS status. The requirement as written is only applicable to Transmission Operator. Referring to the NERC Functional Model, the RC must maintain a wide area view and is responsible for establishing IROL and SOL in some cases therefore, the RC needs to be notified of AVR & PSS status changes.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**Shelby Wade - PPL - Louisville Gas and Electric Co. - 3,5,6 - SERC, Group Name** Louisville Gas and Electric Company and Kentucky Utilities Company

**Answer**

Yes

**Document Name**

**Comment**

Yes, if the RC does not receive information when the AVR status has changed after 30 minutes, then the RC study results may not be accurate. If the RC is not aware that an AVR is not working properly, the study results could indicate that there is not a risk to the BES when there could be. The TOP and RC do similar reliability studies.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.



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

**Answer** Yes

**Document Name**

**Comment**

In our opinion the GOP should only notify the TOP. This forces the TOP to be in the loop and aware of the voltage/reactive issues which are more local than global (at least at the start of an event). To the extent the TOP cannot address the voltage issue, with say distribution or transmission capacitors or other devices, and then the RC can be in the solution loop. However, we believe that the TOP should notify the RC. This is minimal and with the continuous dialogue between TOP and RC really not a logistical problem either.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6, Group Name Dominion**

**Answer** Yes

**Document Name**

**Comment**

IRO 10 provides the vehicle for the RC to obtain reliability related information. It is redundant to mandate that the RC receive specific information regardless of its impact on reliability.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**Thomas Foltz - AEP - 3,5**

**Answer** Yes

**Document Name**

**Comment**

While there is a reliability impact, we believe the RC may already request such information in accordance with directives currently provided in IRO-010-2.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to capture the comments that IRO-010-2 addresses the issue by allowing the Reliability Coordinator to identify and request such information. Therefore, no reliability gap exists.

**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**

Thank you for your comment.

**3. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-002-4 template. If you disagree with any of the observations, please list the reference number when providing comment.**

**Thomas Breene - WEC Energy Group, Inc. - 3,4,5,6**

**Answer**

**Document Name**

**Comment**

2.2 - should be included in the Measure as a potential means for providing notification, not the requirement. Also, as mentioned TOP-003 allows the TOP to identify the method for providing data. The measure should also include "or other method prescribed by the TOP".

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) modified the recommendation and relocated it from Attachment 4, Item 2.2 to Attachment 5, Item 2.4.

*Template: In Requirement R3, clarify that the Generator Operation shall provide notification to the Transmission Operator that is mutually agreeable to the Transmission Operator. This would clarify which medium is available or unavailable for Generator Operator to use for notification, which will avoid the Requirement from prescribing the method (e.g., phone call, telemetry, email, etc.).*

**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
<b>Response</b>	
Julie Hall - Entergy - 6, Group Name Entergy/NERC Compliance	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
<p>From review template.</p> <p>2.1 – Agreed,</p> <p>2.2 Means of notification is agreed between GOP and TOP and is not need to be specified in the requirement. This should be addressed in detail in the TOP's TOP-003 Data Specification. If it is clarified that telemetry can be used, clarify that this is at the discretion of the TOP's TOP-003 Data Spec (may not be acceptable to all TOPs, while it is allowed by NERC).</p> <p>2.3 Agree</p> <p>2.4 Already clear, no additional clarity needed.</p> <p>2.5 Clear as is, not needed, but if changes are made they need to be made in R3 per the structure of the requiriement.</p> <p>2.6 and 2.7, agree that this content needs to be clarified and that the Section 4, Applicability, is the appropriate place to do that.</p>	
Likes	0
Dislikes	0

**Response**

Thank you for your comments.

2.1 Thank you for your comment.

2.2 The periodic review team (PRT) modified the recommendation and relocated it from Attachment 4, Item 2.2 to Attachment 5, Item 2.4.

2.3-2.4 Thank you for your comment.

2.5 The PRT has retained this item as many of the stakeholder responses indicate that clarity could be improved.

2.6-2.7 Thank you for your comment.

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

**Answer**

**Document Name**

**Comment**

No Comment

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 2.2: This clarity is not needed since the TOP specifies the notification methods via BAR-0001-4.1, R5.2 and possibly in TOP-003-3.

Item 2.3: Not needed as R4 of VAR-002-4 already states "... a change in reactive capability".

Item 2.5: The use of status in the main requirement of R4 refers to changes of the status of control detailed in R3, namely the change in status of the AVR, power system stabilizer, or alternative voltage controlling device. The "on" found at the beginning of the second line of R3 in VAR-002-4 is what needs to be changed to "of".

Item 2.6: We disagree with removing this bulleted section of R4. It clearly exempts dispersed generating resources from R4 if this is retained. The purpose of this exemption was so that the status of individual inverters at such a site would not have to be individually reported.

Likes 0

Dislikes 0

**Response**

Thank you for your comments.

2.2 The periodic review team (PRT) modified the recommendation and relocated it from Attachment 4, Item 2.2 to Attachment 5, Item 2.4.

2.3 The PRT is retaining its recommendation, but notes that the recommendation is intended to clarify what needs to be communicated.

2.5 The PRT has retained this item as many of the stakeholder responses indicate that clarity could be improved.

2.6 The PRT has retained this item as many of the stakeholder responses indicate that clarity could be improved; however, the PRT made a clarifying change to item 2.6.

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

**Answer**

**Document Name**

**Comment**

For 2.2, if telemetry is stipulated to be acceptable for notification of AVR status change, it should be emphasized that email is not appropriate for notification. Most TOP operators work shifts and even if an email addresses is available for a group, the operator may not be monitoring emails in a timely manner to be sufficient for notification of operational issues.

Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) modified the recommendation and relocated it from Attachment 4, Item 2.2 to Attachment 5, Item 2.4.	
<b>Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
No comment.	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
The NSRF agrees.	
Likes 0	



Dislikes	0
<b>Response</b>	
Thank you for your comment.	
<b>Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
Part 2.2: Duke Energy agrees that telemetry is a sufficient method of notification to the TOP of an AVR status change. An issue could arise wherein the GOP relies on telemetry to serve as a notification to the TOP, only to find out that the telemetry was not working properly, or failed to alarm, during the status change.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment. The periodic review team (PRT) modified the recommendation and relocated it from Attachment 4, Item 2.2 to Attachment 5, Item 2.4.	
<b>Rachel Coyne - Texas Reliability Entity, Inc. - 10</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
Texas RE appreciate the SDT's efforts and careful review of the VAR-002-4 Standard. To that end, the SDT has identified a number of typos and non-substantive corrections that should be addressed. However, the in identification of these technical edits, the SDT indicated in item 2.2 that a future SDT may wish to clarify that "telemetry is a sufficient means of providing notification." From Texas RE's perspective, this	

constitutes a substantive departure from standard applications of notification requirements. Put differently, Texas RE views the notification requirements in VAR-002-4, R3 as designed to specifically highlight changes in generator voltage regulation capability. Such changes could be lost in a broad stream of telemetered data, potentially reducing a TOP's situational awareness regarding the level of voltage control available at specific generation resources in real-time.

While it may be possible to provide adequate notice through telemetry of AVR status changes, such an issue goes beyond a mere clarification and will require substantive development regarding possible impact. As such, the inclusion of this element is inappropriate as an errata item and should be fully vetted as a substantive change in any possible future projects involving a new version of VAR-002.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has retained this item as many of the stakeholder responses indicate that clarity could be improved. The PRT modified the notification recommendation and relocated it from Attachment 4 (errata changes), Item 2.2 to Attachment 5 (miscellaneous changes), Item 2.4.

**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 these administrative type observations. However, we believe Paragraph 81 requirements do exist within this standard, particularly with Requirement 6 which requires GOs to provide certain modeling data upon request. Nonetheless, we believe pursuing a resolution to these administrative type concerns is a step in the wrong direction for a standard that is not often violated.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. The periodic review team (PRT) has retained this item as many of the stakeholder responses indicate that clarity could be improved.

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

**Answer**

**Document Name**

**Comment**

Reclamation agrees with the proposed errata.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**4. There are a number of other observations in Attachment 5 of the VAR-002-4 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.**

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

Answer

Document Name

Comment

ERCOT does not believe a revision to the standard is necessary. However, if a project is established, ERCOT suggests that the term “Automatic Voltage Regulator” could be defined to add clarity.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**Michael Godbout - Hydro-Québec TransÉnergie - 1 - NPCC**

Answer

Document Name

Comment

In VAR-001-4, we commented that Attachment 5, point 5.3 was a valid point. It applies here to Requirements 5 and 6.

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 possibility. 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.

These same two requirements R6) (and the matching requirement in VAR-001-4.1) 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 requirements, as written, cause us no problems: As TOP, we do not micro-manage our GOPs transformer taps. However, when the standard is revised, it should be rewritten to reflect a performance-based approach.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer**

**Document Name**

**Comment**

Reclamation agrees with the proposed observations.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**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 these other observations regarding the standard. However, we believe pursuing a resolution to these administrative type concerns is a step in the wrong direction for a standard that is not often violated.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**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**

Thank you for your comment.

**Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF**

**Answer**

**Document Name**

**Comment**

Many of the corrections / revisions involve changes to time horizons, VSLs and minor wording changes do not rise to the level of securing a SDT for revisions. NSRF would support an 'errata' change for corrections.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6**

**Answer**

**Document Name**

**Comment**

No comment.

Likes 0

Dislikes 0

**Response**

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

**Answer**

**Document Name**

**Comment**

Reference 14.2 should also address Startup/Shutdown operation of a Power System Stabilizer (PSS) for cases where the PSS is external (i.e., a standalone component) or if the PSS is internal to an AVR.

In addition, 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. This should be recognized in the Standard to eliminate unnecessary communications for routine operations.

Reference 14.2 is not clear that the "on/off" position of a PSS could be external or internal to an AVR.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer**

**Document Name**

**Comment**

For 2.1, Requirement R2, Part 2.3 should not have the clause “specified by the Transmission Operator” removed. It is not unnecessary. We believe that the GOP should not be able to have a methodology of their choosing without approval from the TOP. For example a GOP methodology might be advantageous to providing lower MVAR resources.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.



<b>Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name</b> Southern Company	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
<p>Item 2.1: Subrequirement R2.3 of VAR-002-4 is not needed and should be move to a technical guidance section of the standard.</p> <p>Item 4.4: No additional statement is needed for M1 because the phrase "voltage schedule" does not appear any where in R1 or M1 of VAR-002-4.</p> <p>Item 6.1: Simply removing "fixed" from R5.1.2 will resolve the concern.</p> <p>Item 10.1: The suggested change would be more appropriate for sites that contain the plant voltage controller, as the individual generator usually is not a voltage controller. The individual generator controller receives var or pf commands typically from a site voltage controller. In contrast, adding this term may cause problems for existing DGR facilities that do not have site voltage controllers. Would they be required to add equipment to be able to comply?</p> <p>Item 10.2: The concern of this section is not clear. R2 of VAR-002-4 specifies that a GOP follow the voltage schedule. R3 of VAR-002-4 specifies that the GOP must notify the TOP of changes the voltage controlling equipment in the first 30 minutes of the change. These two requirements are not misunderstood by GOP's.</p> <p>Item 14.2: Any requirement for the existance of a PSS is dictated either by the interconnection requirements of the TOP or by regional requirements, and does not need to be dictated by NERC.</p> <p>Item 16.1: This level of details for PSS settings is not qppropriate for the NERC standard. Detailed requirements and guidelines for PSSs should be addressed at the regional level, which is the current practice.</p>	
Likes	0
Dislikes	0
<b>Response</b>	

Thank you for your comment. Based on minority response, the periodic review team (PRT) affirms that there may be future opportunities to revise the standard or provide technical guidance (e.g., guideline) outside of a Reliability Standard.

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

**Answer**

**Document Name**

**Comment**

It is unclear to BPA if all of the observations in Attachment 5 would be considered relevant to VAR-002 if a drafting team was convened. BPA believes it may be more efficient to have a small technical review team evaluate these observations and then make a determination and recommendation to NERC.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer**

**Document Name**

**Comment**

From the review template:

2.1 Disagree, this needs to stay for clarity

2.2 Agree, to be in keeping with TOP standards, "would violate safety, equipment, regulatory, or statutory requirements"

4.1 agree

4.2 Agree

4.3 agree

4.4 Neutral, seems adequately clear without but is not harmed by adding the verbiage.

6.1 For 5.1.2, agree

10.1 and 10.2: Agree that this requires clarity, but this should be taken care of in section 4, Applicability. (see note for 2.6/2.7 above)

14.1 Recommend identifying the "GSU owner" and not tying it to any functional entity.

14.2 Agree that clarity is needed, but recommend that a new "Requirement 4" be inserted to treat PSSs. Include addressing "initial expected state" in new requirement as well.

16.1 Agree, see comments on 14.2

Likes 0

Dislikes 0

**Response**

Thank you for your comment. Based on minority response, the periodic review team (PRT) affirms that there may be future opportunities to revise the standard or provide technical guidance (e.g., guideline) outside of a Reliability Standard.

**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	
<b>Response</b>	
<b>Thomas Breene - WEC Energy Group, Inc. - 3,4,5,6</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
<p>Attachment 5, 14.2: Greater clarity is required regarding the initial status of the PSS. Currently R1 and R3 create ambiguity. A review of NERC Notices of Penalty (NOPs) appears to indicate that precedent exists for notification to the TOP for changes to the expected state of the PSS upon startup and synchronization of the Generator to the Interconnection. Data specifications created by TOPs under TOP-003 create another source of guidance to the GOP further complicating a definitive understanding of the requirement.</p>	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment.	

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

**Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6, Group Name** Dominion

**Answer** No

**Document Name**

**Comment**

It is difficult to determine the cost impacts relative to the reliability benefits without additional studies and information.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer** No

**Document Name**

**Comment**

Any changes made to the standard which may cause existing facilities to not have automatic controls systems that are capable of meeting the new requirement should be evaluated on feasibility and cost.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**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**

**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**

Thank you for your comment.

**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-002-4, but asserts that the standard would be more cost-effective after incorporating the above suggestions.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**Thomas Foltz - AEP - 3,5**

**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	
<b>Response</b>	
<b>Preston Walker - PJM Interconnection, L.L.C. - 2 - RF</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC</b>	
<b>Answer</b>	Yes



<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Jesus Sammy Alcaraz - Imperial Irrigation District - 1</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	

<b>Response</b>	
<b>David Jendras - Ameren - Ameren Services - 1,3,6</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Chris Scanlon - Exelon - 1,3,5,6</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Laura Nelson - IDACORP - Idaho Power Company - 1</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	

<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Shelby Wade - PPL - Louisville Gas and Electric Co. - 3,5,6 - SERC, Group Name</b> Louisville Gas and Electric Company and Kentucky Utilities Company	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	

<b>Response</b>	
<b>Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	

**Comment**

Likes 0

Dislikes 0

**Response**

**David Ramkalawan - Ontario Power Generation Inc. - 5**

**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**

<b>Brian Van Gheem - ACES Power Marketing - 6 - NA - Not Applicable, Group Name ACES Standards Collaborators</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes	0
Dislikes	0
<b>Response</b>	
<b>Rachel Coyne - Texas Reliability Entity, Inc. - 10</b>	
<b>Answer</b>	
<b>Document Name</b>	
<b>Comment</b>	
Texas RE does not have comments on this question.	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment.	

**6. Given the items identified by the periodic review team in the VAR-002-4 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.**

**Russel Mountjoy - Midwest Reliability Organization - 10, Group Name MRO NSRF**

**Answer** No

**Document Name**

**Comment**

NERC VAR-002 R4 does not contain magnitude criteria for the change in reactive capability that requires coordination. Requiring coordination of any and all changes in reactive capability could negatively impact reliability, by distracting from other reliability functions. NSRF does not believe that this was the intention of this requirement or NERC would not allow the exemption of the individual generating units of dispersed power producing resources identified through Inclusion I4 of the Bulk Electric System definition.

The TOP should specify the magnitude of Reactive Power required to be coordinated based on their system studies. This is something that could be addressed in the TOP data specification required in TOP-003-3. However, There is concern that this may not be the case as the reactive reserve requirement no longer exists.

Likes 0

Dislikes 0

**Response**

Thank you for your comment. This issue is captured under Attachment 5, Clarity 2.3 where it can be addressed during a future revision.

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

**Answer** No

**Document Name**

**Comment**

Realize that if VAR-001 is changed significantly with any requirements removed, then in response VAR-002 may need to be changed.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**Thomas Breene - WEC Energy Group, Inc. - 3,4,5,6**

**Answer**

No

**Document Name**

**Comment**

The standard should be revised to address R3 and the initial status of the PSS.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

**Michael Godbout - Hydro-Québec TransÉnergie - 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, the standard will have to be revised and cleaned up though.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**Answer**

Yes

**Document Name**

**Comment**

Reclamation identifies the following issue for consideration:

- Reclamation asserts that registered entities’ internal compliance programs’ auditability of R4 would be enhanced if examples of “a change in reactive capability due to factors other than a status change described in Requirement R3” were provided in the measures or a guidance document.

Reclamation asserts that VAR-002-4 should be modified to include the above 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**

Thank you for your comment.

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

<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
We thank you for this opportunity to provide these comments.	
Likes 0	
Dislikes 0	
<b>Response</b>	
Thank you for your comment.	
<b>David Ramkalawan - Ontario Power Generation Inc. - 5</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
<p>Clarification is required for 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)” to specify that AVR shall be in automatic voltage control mode and PSS (if provided) in service, as there can be cases where the PSS is an external device and is monitored differently than when the PSS is an internal function of the AVR.</p> <p>The following Note 1 requires revision: “1 Start-up is deemed to have ended when the generator is ramped up to its minimum continuously sustainable load and the generator is prepared for continuous operation.” There may be cases when the generator is at the minimum continuously sustainable load and the PSS based on the settings is not in service at that power level (i.e. PSS I/S when P&gt;30%)</p> <p>R4 the 30 minutes requirement can be interpreted as not satisfied if and end core cooling alarms is received and the entity will take time to investigate the validity of the alarm. We can only know that the degradation of the End Core cooling will impact the reactive power capability when required to operate in the leading mode.</p>	

R5 Part 5.1 clarification required with respect to step-up transformers primary/secondary and voltage levels.

R6 - Clarification required regarding equipment limiters versus equipment ratings

Likes 0

Dislikes 0

### Response

Thank you for your comment. Based on minority response, the periodic review team (PRT) affirms that there may be future opportunities to revise the standard or provide technical guidance (e.g., guideline) outside of a Reliability Standard.

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

**Answer**

Yes

**Document Name**

### Comment

Duke Energy recommends that the drafting team consider whether the language used in R3 (and R4) requiring a GOP to notify its TOP within 30 minutes of a status change in AVR, PSS, or alternative voltage control device is open to varying interpretations. For example, if a GOP recognizes that the status changed 15 minutes after the change occurred, the GOP evaluates and initially feels they can address and restore the status within the 30 minutes. The GOP ultimately is not able to restore in the remaining 15 minutes. Is the GOP non-compliant if they do not notify the TOP until minute 31? We feel that revising the language, or issuance of additional guidance on this topic would be beneficial to industry stakeholders.

Likes 0

Dislikes 0

### Response

Thank you for your comment.

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

**Answer**

Yes

<b>Document Name</b>	
<b>Comment</b>	
<ol style="list-style-type: none"> <li>1. It would be beneficial if there were some guidance/example on what constitutes a "change" in reactive capability that falls within the scope of the Standard.</li> <li>2. The Standard is not clear that it applies to an external PSS AND to newer technology AVRs that have an internal PSS input (enable/disable). The SDT should ensure that the guidance is clear to the industry on the various applications of a PSS.</li> <li>3. The SDT should consider developing a technical justification/rational for the 30 minute requirement to communicate a status change or reactive capability change.</li> </ol>	
Likes	0
Dislikes	0
<b>Response</b>	
Thank you for your comment.	
<b>Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name</b> Southern Company	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
With the exception of the items noted in this comment form, we are in general agreement with the findings of the periodic review team.	
Likes	0
Dislikes	0
<b>Response</b>	

Thank you for your comment.

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

**Answer** Yes

**Document Name**

**Comment**

Requirement 2 should list how long the voltage can be outside the TOP provided Generator Bus Voltage schedule. It should provide guidance as to how long the operator has to return the voltage to within the schedule. This guidance would provide assistance to the auditor and to the GOP who is determining when to submit a self report.

Likes 0

Dislikes 0

**Response**

Thank you for your comment.

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

**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	
<b>Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group</b>	
Answer	Yes
Document Name	
Comment	
Likes	0
Dislikes	0
Response	
<b>Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7,8,9,10 - NPCC, Group Name RSC no ISO-NE</b>	
Answer	Yes
Document Name	
Comment	
Likes	0

Dislikes 0	
<b>Response</b>	
Sandra Shaffer - Berkshire Hathaway - PacifiCorp - 6	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
Aubrey Short - FirstEnergy - FirstEnergy Corporation - 1,3,4	
Answer	Yes
Document Name	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
Shelby Wade - PPL - Louisville Gas and Electric Co. - 3,5,6 - SERC, Group Name Louisville Gas and Electric Company and Kentucky Utilities Company	

Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
<b>Laura Nelson - IDACORP - Idaho Power Company - 1</b>	
Answer	Yes
Document Name	
Comment	
Likes 0	
Dislikes 0	
Response	
<b>Stephanie Burns - International Transmission Company Holdings Corporation - 2 - MRO,SPP RE,RF</b>	
Answer	Yes
Document Name	
Comment	
Likes 0	



Dislikes 0	
<b>Response</b>	
<b>Jesus Sammy Alcaraz - Imperial Irrigation District - 1</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Aaron Cavanaugh - Bonneville Power Administration - 1,3,5,6 - WECC</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Sean Bodkin - Dominion - Dominion Resources, Inc. - 3,5,6, Group Name Dominion</b>	
<b>Answer</b>	Yes

<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Michelle Amarantos - APS - Arizona Public Service Co. - 1,3,5,6</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Preston Walker - PJM Interconnection, L.L.C. - 2 - RF</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	

<b>Response</b>	
<b>Glen Farmer - Avista - Avista Corporation - 1,3,5</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Thomas Foltz - AEP - 3,5</b>	
<b>Answer</b>	Yes
<b>Document Name</b>	
<b>Comment</b>	
Likes 0	
Dislikes 0	
<b>Response</b>	
<b>Rachel Coyne - Texas Reliability Entity, Inc. - 10</b>	
<b>Answer</b>	
<b>Document Name</b>	

**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 voltage 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**

Thank you for your comment. The consensus of the industry is the standard is sufficient to protect reliability and meet the reliability objective of the standard. The periodic review team (PRT) has modified its Enhanced Periodic Review Recommendation document to reflect the majority of industry comment. The PRT agrees that Automatic Voltage Regulator (AVR) definition could provide additional clarity as identified in the VAR-001-4.1 Enhanced Periodic Review Recommendation document, Attachment 5: Other Miscellaneous Corrections/Revisions, Item 3.1 in a future revision.

***Comments received from Leonard Kula of IESO*****Questions**

- VAR-002-4, Requirement R2, requires the GOP to maintain generator voltage or Reactive Power schedule. Requirement R2, Part 2.3 requires a methodology for converting the voltage to the point being monitored by GOP, as applicable. Is Requirement R2, Part 2.3 necessary as a Requirement or is it sufficient to be a Measure (or technical guidance) of maintaining the voltage or Reactive Power schedule as required by Requirement R2? If yes, please explain.

Yes

No

Comments:

**Part 2.3 is not required. Inserting the appropriate wording in the Measure or technical guide would suffice.**

2. In VAR-002-4 Requirement R3 the GOP notifies the TOP when the AVR status has changed after 30 minutes. There is no requirement for a notification from either the TOP (or GOP) to be submitted to the RC. Is there an impact to reliability? If yes, please explain.

Yes

No

Comments:

**Yes, there is a potential reliability impact if the RC is not aware of a change in the AVR status in 30 minutes.**

3. There are a number of errata (i.e., administrative) type observations listed in Attachment 4 of the VAR-002-4 template. If you disagree with any of the observations, please list the reference number when providing comment.

Comments:

**We generally agree with the errata listed in Attachment 4.**

4. There are a number of other observations in Attachment 5 of the VAR-002-4 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 observations listed in Attachment 5.**

5. 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:

6. Given the items identified by the periodic review team in the VAR-002-4 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,<sup>1</sup> shutdown,<sup>2</sup> 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.

**End of Report**