Individual or group. (79 Responses)
Name (52 Responses)
Organization (52 Responses)
Group Name (27 Responses)
Lead Contact (27 Responses)
IF YOU WISH TO EXPRESS SUPPORT FOR ANOTHER ENTITY'S COMMENTS WITHOUT ENTERING ANY ADDITIONAL COMMENTS, YOU MAY DO SO HERE. (8 Responses)
Comments (79 Responses)
Question 1 (65 Responses)
Question 1 Comments (71 Responses)
Question 2 (67 Responses)
Question 2 Comments (71 Responses)
Question 3 (59 Responses)
Question 3 Comments (71 Responses)
Question 4 (0 Responses)
Question 4 Comments (71 Responses)

Group
Northeast Power Coordinating Council
Guy Zito
Yes
The SAR should not be posted with the Standard. The intent of posting a SAR for comment is to seek industry's input on the need and scope of a proposed standard's development or revision. Posting the Standard for comments and ballot means that the SAR is "water under the bridge", and that industry's input on the SAR doesn't mean anything.
Yes
VAR-002 uses footnote (3) on page 6 to clarify the phrase "voltage or Reactive Power schedule." VAR-001 does not use a footnote or otherwise define "voltage or Reactive Power schedule." Intead of using a footnote to clarify/define the phrase, add the phrase "voltage or Reactive Power schedule" to the Definitions of Terms Used in the Standard, making sure it is applicable to both VAR-001 and VAR-002. Suggest adding the following wording to both VAR-001 and VAR-002: Definitions of Terms Used in the Standard: Voltage or Reactive Power Schedule – A target value communicated by the Transmission Operator to the Generator Operator establishing a tolerance band within which the target value is to be maintained during a specified period. If this definition is added to VAR-001 and VAR-002, then VAR-002 footnote (3) should be deleted. For VAR-001-4: Recommend adding "upon request" to this sub-requirement to make it read: "Each Transmission Operator shall provide a copy of these documented policies or procedures to adjacent Transmission Operators, upon request." VAR-001 uses the term "real-time" (no capitalization) throughout, whereas VAR-002 uses the term "Real-time" (capitalized) in R1. The capitalized term is defined in the NERC Glossary of Terms Used. The Glossary definition is the meaning intended for both standards. Please use consistent terminology employing the capitalized Glossary term "Real-time" throughout both Standards. Regarding VAR-001, typically, the voltage and Reactive Power (VAR) output of a generator may be adjusted by one or more of three means: a no-load tap changer (NLTC), a load-tap changer (LTC), or an automatic voltage regulator (AVR). The requirements in the VAR-001 Standards should more fully and clearly address these Real-time and periodic NLTC, LTC and AVR changes or adjustments. The following wording changes are proposed for VAR-001 Requirements R1, R3, R4 and R6: The language of R1 includes key words such as "implemented" and "control voltage," representing Real-time actions taken by a TOP to keep voltages within limits that could be interpreted to include actions such as switching shunt capacitors/reactors, adjusting transformer taps, adjusting transfers, adjusting generation or other dynamic VAR sources (like SVC's). The intent of R1 may simply be to address the RC monitoring issue, as directed by FERC Order 742 (see Rationale for R1). However, the R1 language can also be interpreted to include the Real-time aspects of R4 creating a potential overlap. Depending on the interpretation and intent of the drafting team for R1, might R4 be a candidate for elimination? Regardless, clarity of wording and intent in R1 is needed. If the intent in R1 is to respond to FERC's

Order 742 directive to assure “monitoring,” then the Drafting Team should consider deleting the action verb “implemented.” The revised wording would read: R1. Each Transmission Operator shall have documented policies or procedures that are to establish, monitor, and control voltage levels and Reactive Power flows (Mvar flows) within limits … If “implemented” is not deleted, then it should be replaced by words conveying the intended meaning, e.g., “that are monitored and enforced.” However, there enforcement is inherent in all standards that all “documented policies or procedures” will be enforced. Application is verified by audit. Adding the phrase “that are implemented” is not needed, and can possibly lead to confusion. The TOP should only be required to develop exemption criteria in R3 if there is an established need for generator exemptions. Once the TOP has determined that there is a need for generator exemptions, only then should it be required to develop and implement exemption criteria. We recommend changing to word of R3 to not only conform to the appropriate Requirement format but include the preceding: R3. Each Transmission Operator shall determine the criteria that shall exempt generators from R4. Requirement R4 may already be covered by FAC-001 and Requirement R1 and may be deleted. But if not, it should be clarified recognizing the following: NLTCs are typically mechanically-fixed at time of generator interconnection and are only adjusted, if necessary, during a generator outage. The NLTCs may not be adjusted in Real-time. The TOP typically establishes initial voltage and Reactive Power requirements in the Interconnection Agreement under FAC-001-0, which states: R2. The Transmission Owner’s facility connection requirements shall address … R2.1.9. Voltage, Reactive Power, and power factor control. The interconnection provisions of R4 are covered in FAC standards. Non-Real-time Periodic timeframe changes in the NLTC settings may be addressed under Requirement R6. Requirement R6 does not appear to refer to Real-time operations and may be deleted from the Real-time standard. However, if it is not deleted, the wording should be revised to address NLTCs only. NLTCs are typically mechanically-fixed at time of generator interconnection and are only adjusted, if necessary, during a generator outage. The NLTCs may not be adjusted in Real-time. The initial NLTC settings are typically addressed during the generator interconnection process (see FAC-001). The need for a NLTC change is typically determined by the TOP through periodic (e.g., seasonal, 5-yr.) system studies. NLTCs adjustment are determined by and directed by the TOP. Alternatively, a load tap changer (LTC) may be adjusted by the GOP under load in Real-time. The setting of any LTC and the automatic voltage regulator (AVR) are typically under the control of the GOP. If this Requirement is referring to a LTC operation in Real-time, it is inappropriately assigned to the TOP. The GOP should have the flexibility to follow its voltage and Reactive Power schedule using the LTC and/or AVR. Alternatively, if the requirement is addressing changes applicable only to the NLTC, then it should be reworded accordingly. We assume the intent is to address NLTC tap changes only and recommend a wording/format change as follows: R6. Each Transmission Operator shall determine the need for generator step-up transformer no-load tap changes. 6.1 After consulting the Generator Operator regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Operator specifying the required tap changes, a timeframe for making the changes, and technical justification for these changes. R1 can be interpreted to require a TOP to have documented policies or procedures in place that can be implemented to establish, monitor, and control voltage levels and Reactive Power flows (Mvar flows) within limits as defined in Parts 1.1 to 1.3. However, Part 1.1 requires that the policy/procedure shall include criteria used in system assessments. What is “system assessments” intended to mean? What is “criteria for the assessments” intended to mean, especially in relation to “established steady-state limits, voltage stability limits, etc.? If the assessments were meant to yield the “limits”, then there it is confusing as to what limits are intended to be developed in relation to the “established” limits. In Order 693, P. 1868, FERC directs the ERO to modify VAR-001-1 to include more detailed and definitive requirements on “established limits”. Does it mean more detailed and definitive requirements on stipulating voltage and reactive requirements with respect to established limits (SOLs, IROLs, voltage level, etc.), or does it mean more details on limits (boundaries) of the interconnection voltages as implied by Requirement R8 of the existing VAR-001 Standard? Requirement R1 does not provide clarity since Part 1.1. refers to “established steady-state limits, voltage stability limits”, which is different from the “established limits” presented in the R8 of the existing VAR-001 standard. Requirement R1 as presented does not provide any clarity as to what practice a TOP is required to meet. Requirement R1 as presented is unclear on its objective and the exact actions required of the Responsible Entity as there are a number of “criteria” and “limits” in the main requirement and its part 1.1 that are confusing and subject to different interpretations. R1 as presented will leave a Responsible Entity not knowing what it needs to do to meet Requirement and its reliability objectives.

Suggest that R1 and its parts be revised to clarify its intent, especially on the who, the specific actions and expected outcome according to the results-based principle and guideline. With respect to part 1.1, Measure M1 asks for evidence that proves voltage is currently being monitored. “Such evidence may include, but is not limited to: 1) proof that points are telemetered, 2) alarms are functioning, and 3) during events of low or high voltage the policies and procedures are being followed to respond to control voltage levels.” These examples of evidence do not reflect the scope and depth of R1 and Parts 1.1 (the criteria and assessment parts). R2 as presented appears to go beyond the FERC directive that RC be included to be assigned the “monitoring responsibility” as R2 now requires the RC to “….perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1.” The inclusion of RC in this requirement is also inconsistent with the view presented in the Informal Consideration with respect to parity between TOPs and RCs. Parts 2.1 and 2.2 stipulate a number of tasks for the TOPs with respect to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow, and to ensure that sufficient reactive resources have been scheduled to meet the acceptable day-ahead voltage limits identified in Requirement R1. These tasks do not involve the RC. It thus raises a question on the need for including RC in the main requirement when it is not required to take further actions to assure its assessment of “sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions” can be fulfilled in real-time operations. We believe the inclusion of RC in this requirement is inappropriate, or if there is a compelling reason to include the RC, then Parts 2.1 and 2.2 are insufficient to assure the RC’s assessment can be supported in real-time operations. Requirement R2, Part 2.1 stipulates that the Transmission Operator has two things (operate or direct) that can be done to “…regulate transmission voltage and reactive flow necessary to regulate transmission voltage and reactive flow which may include…”. Part 2.1 should only contain one thing. The order of Requirements R3 and R4 should be reversed since the exemption criteria (R3) should appear after the overarching requirements for GOs to maintain a voltage or Reactive Power schedule and tolerance band. Regarding Requirement R5, suggest replacing “know” with “monitor”. This provides an active approach, which is appropriately reflected by the wording in Measure M5. In the Compliance Section, there is no requirement for the RC to retain evidence for Measure M2. Further, there is no requirement for the TOP to retain evidence for Measures M5 and M6. Regarding the VSL for R1, there is no explicit requirement in R1 for the TOP to provide a copy of the assessment criteria to its RC or neighbor TOPs since the assessment criteria are supposed to be included in the policy or procedure document. The Low VSL thus serves no purpose. Further, from the standpoint of meeting the intent of Requirement R1, there is little to no difference between having documented policies or procedures which do not include any of the elements stipulated in Parts 1.1 to 1.3, and having no documented policies or procedures at all. Suggest to remove the Low VSL and the High VSL, and keep the Moderate VSL and revise the Severe VSL to include the condition presented in the High VSL as an “OR” condition under the Severe VSL. Regarding the VSL for R2, throughout R2 there are no specific requirements for having policies and procedures implemented to have sufficient MVARs. R2 requires the TOP and RC to perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions. Part 2.2 stipulates the requirements for scheduling reactive resources to meet the reactive requirements resulting from day-ahead assessments. Part 2.1 stipulates the requirement to operate or direct the real-time operation of devices necessary to regulate transmission voltage and reactive flow. While the Moderate VSL, which addresses non-compliance with Part 2.2 and appears to be reasonable, the Severe VSL does not correspond to how Part 2.1 is presented. The condition that “A lack of real-time operations is also severe.” seems irrelevant to Part 2.1 when it comes to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow. There can be no lack of real-time operations, but a TOP may totally ignore the operations or directing the operations of devices necessary to regulate transmission voltage and reactive flow. There is no VSL for the RC failing to meet R2. Hence, the RC is assigned a responsibility but its compliance is not measured and there is no VSL to determine its non-compliance. Regarding the VSL for R5, the conditions in the Moderate and High VSLs are irrelevant to the requirement. R5 requires a TOP to know (monitor) the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in its system. The Moderate VSL makes reference to a “stable area”, which is totally irrelevant and out of context of R5. In the High VSL, the TOP not knowing “the status of important equipment in weaker areas that were identified in assessments as part of R1.” are also irrelevant and

out of context of R5. Finally, there is no Severe VSL. What constitutes a total failure to comply with Requirement R5? Regarding the VSL for R6, the Low VSL should have an “is”, not an “are”. There is no Severe VSL and hence there is no condition to constitute a total failure to comply with Requirement R6. VAR-002-3 Regarding Measure M2, M2 presents the scenarios where a Generator Operator may not be able to meet a voltage schedule or comply with the TOP’s directive, and how a GOP may manage the situations. The description part does not belong in a Measure, and should be moved to the Background Information Section that a Results-based standard template has made provision for. Regarding Measure M3, the latter part of M3 is not presented in a manner to require the evidence to demonstrate compliance. Suggest revising M3 to read: The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any of the changes identified in Requirement 3, or evidence that the status had been restored within the first 15 minutes of such change. For all Measures, there are no examples of evidence provided. It would be appropriate if after each of the “evidence”, additional wording “such as log, recording, or other documents” so as to be consistent with the way Measures are presented in other standards. Regarding Evidence Retention, it would be appropriate to reference the Measure Number for the GO’s and the GOP’s data retention requirements.
No
NERC’s Reliability Issue Steering Committee (RISC) is charged to address emerging reliability issues and recommend preferred approaches to manage such issues. Whether or not the TOP/GOP voltage coordination issue should rise up to a risk level that warrants special attention by the industry, and whether the appropriate way to address this issue in a standard project will be best evaluated and determined by the RISC. We suggest that the Drafting Team nominate this issue for RISC consideration. The Requirements in both VAR-001-4 and VAR-002-3 should be reviewed to ensure they are in the correct NERC Standard Development format.
Group
Arizona Public Service Company
Janet Smith, Regulatory Affairs Supervisor
No
Yes
VAR-001-4: R1: In addition to controlling voltage, R1 also requires procedure for control of reactive flow. Reactive flows are hard to control and there is no reliability benefits for controlling the reactive flow. Reference to reactive flow should be deleted. R2: This requirement is a duplication of requirements in other standards such as in TPL standards. Reactive assessment should not be part of this standard. R5: This requirement is unnecessary. A GO is already obligated to provide the status of AVR and PSS information to TO (VAR-002-3). This requirement puts unnecessary burden on TO to monitor status of all AVR and PSS. Particularly, TO does not have any value in knowing the PSS status. He cannot do anything with that information. There is no reliability benefit of this requirement. If the drafting team thinks that knowing the status of PSS is necessary for TO, please provide the rational. VAR-002-3: R3: Notifying the status of PSS is unnecessary since TO will not use that information for operating system any differently or do anything with that information. If the drafting team thinks that this information is necessary, please provide the rational.
Yes
There is no need to restrict the time to 15 minutes. It should be at least 30 minutes. For any system changes typically 30 minutes are allowed to readjust the system. A TO not knowing the status of AVR for 60 minutes is not going to cause any reliability issue. GO should be given 30 minutes to fix the problem and then 30 minutes to notify the TO if the problem is not fixed.
Individual
Terry Volkmann
Volkmann Consulting

No
Yes
VAR-001-4 R3 establishes the ability for the TOP to exempt a GOP from maintaining a voltage schedule and directing the GOP to perform in automatic and exempts from the report requirements that would be established under R4. VAR-002-3 R1 establishes the GOP requirement to operate in the automatic mode. This requirement is not prefaced with "unless exempted by the TOP". It is unclear that if the TOP has exempted the GOP from maintaining a voltage schedule in automatic and reporting AVR status changes, the GOP still needs to keep the AVR in automatic. If a generator is equipped with an AVR, but exempted by the TOP, one can interpret that the GOP still must maintain a voltage schedule (not TOP established) in automatic. Recommend modifying R1 with the lead in "unless exempted by the TOP,". This would clarify the intended operation of the GOP.
No
Individual
Thomas Foltz
American Electric Power
No
Yes
R5: We recommend that Requirement 5 and the associated subrequirement be applicable only to the Generator Owner and not split between the Generator Owner and Generator Operator.
No
AEP believes that additional coordination regarding high-side voltage schedules compared to low-side measurement (which is typical at the power plants) would be beneficial.
Individual
Dan Roethemeyer
Dynegy
Yes
In VAR-001-4 Applicability section 4.3 says “Generator Operators within the Western Interconnection”. But nowhere in the Standard does it discuss what are the responsibilities of the GOPs in the Western Interconnection. It has to do with the WECC variance to VAR-001 issued by FERC on 6-20-13 but VAR-001-4 does not explain it.
No
Yes
VAR-002-2 R2 requires the GOP to notify its associated TO within 15 minutes if both: 1) the GOP operated outside the voltage schedule for 15 minutes and 2) the GOP is no longer able to return to its voltage schedule. Regarding item 2) above, how long does the GOP have to return to its voltage schedule? Most GOPs eventually return to the voltage schedule, e.g., either a sister unit at the plant site returns from a forced outage boosting voltage or the wider area voltage returns to normal due to circumstances beyond the GOP’s control. If the GOP returns to its voltage schedule 24 hrs later, does that require notification? Regarding item 1) above, setting the threshold for operating outside the voltage schedule at 15 minutes seems overly prescriptive. Suppose a generator operates outside the voltage schedule for 14 mintues and then operates inside the schedule for 5 minutes, and the process repeats itself. The hourly average voltage may be outside the schedule, but the 15 minute threshold is never reached, so no notification is required. A simpler alternative to the 15 minute threshold would be to use a one hour clock average before reporting is required and eliminate item 2).

Group
US Bureau of Reclamation
Erika Doot
Yes
The Bureau of Reclamation (Reclamation) suggests that VAR-001-4 and VAR-002-3 should be combined into one standard because of the reciprocal requirements in each standard (e.g., VAR-001-4 R6 would require the Transmission Operator (TOP) to consult with the Generator Owner (GO) regarding TAP setting changes, and VAR-002-3 R5 requires the GO to ensure that tap positions are changed when possible). If the drafting team prefers not to combine the two standards, Reclamation requests that the drafting team explain why two standards are more appropriate. The Bureau of Reclamation (Reclamation) notes that VAR-001-4 appears to apply to Generator Operators within the Western Interconnection, and the White Paper on the VAR Standards dated July 18, 2013 explains that this is because the WECC variance in VAR-001-3 is retained in VAR-001-4. If the variance is retained, Reclamation suggests that the entire text of the variance should be included in VAR-001-4 rather than incorporated by reference in order to prevent confusion among registered entities. Reclamation also requests that the drafting team explain why the WECC variance would not be beneficial for reliability continent-wide.
Yes
The Bureau of Reclamation (Reclamation) notes that VAR-001-4 appears to apply to Generator Operators within the Western Interconnection, and the White Paper on the VAR Standards dated July 18, 2013 explains that this is because the WECC variance in VAR-001-3 is retained in VAR-001-4. If the variance is retained, Reclamation suggests that the entire text of the variance should be included in VAR-001-4 rather than incorporated by reference in order to prevent confusion among registered entities. Reclamation also requests that the drafting team explain why the WECC variance would not be beneficial for reliability continent-wide.
No
Reclamation believes that the scope of the project is appropriate.
Individual
Dave Willis
Idaho Power Company
No
Yes
VAR-002-3 R2, I think that this requirement is going to be very hard to document compliance. Monitoring voltage at the POI, tracking the time the voltage exceeds the limits and notification to the TOP all will need to be captured.
Yes
I think that the 30 minute notification after a 15 minute violations is reasonable but it think this requirement will be very hard to prove or disprove compliance. Is the intent for the TOP to monitor the GOP or is the GOP responsible to show compliance when there is a deviation. A GOP may not be monitoring the voltage at the POI and unaware that they are outside the voltage limits. If the GOP is not able to bring the bus voltage to within limits and contacts the TOP is there a length of time that they can be outside the bounds.
Coordination is a problem for the requirements in many standards and I'm not sure of a good way to improve coordination. I do not believe that this Standards Project is the time or place to address the issue.
Individual
R. J. Mattey
Ohio Valley Electric Corporation

No
Yes
VAR-001-4, R1, includes details about assessments and critierial that are more related to MOD and TPL standards. VAR-002-3, R2, now has two 15 minute times to track for compliance related to not maintaining a voltage schedule.
Yes
Only that additional compliance time frames have been added. Will a shorter time frame reduce the reliability gap?
This issue should not be addressed in compliance standards. Voltage coordination should be a function of the ERO as part of its normal function, handled through the appropriate committees.
Individual
Jonathan Appelbaum
The United Illuminating Company
Yes
The technical discussion paper last paragraph has a topic on the minority issue of voltage control and states the drafting team will investigate. I believe this should be included in the SAR.
Yes.
Individual
Ronnie C. Hoeinghaus
City of Garland
No
Yes
On all the requirements in VAR-001-4, the Time Horizons are defined as “Operations”. The NERC Document defining Time Horizons lists Operations Planning, Same-day Operations, Real-time Operations, and Operations Assessment – which one do you mean for each requirement? This needs to be corrected for each requirement.
No
Individual
John Seelke
Public Service Enterprise Group
Agree
NAGF SRT (North American Generator Forum Standards Review Team)
Individual
Steve Hill
Northern California Power Agency
Yes
Directive from P1875 states, "... we direct the ERO, through its Reliability Standards development process, to modify Reliability Standard VAR-001-1 to include Requirements to perform voltage stability analysis periodically, using online techniques where commercially-available and offline simulation tools where online tools are not available, to assist real time Operations." What online

models are being referred to? How do we know they are correct in their assessment? If the new TPL standard R5 is approved would this directive and R1 & R5 in the proposed VAR standard be redundant?
Yes
Same comment as in questions and comments as in Comment 1 in regards to R1 & R5. Controllable Load should be defined in R2.
Yes
There does not seem to be consensus on when a reliability gap would be created when expanding the time requirement, but is there consensus that there is no reliability gap with the 15 minute timeframe? There should be data to justify the timeframe to some confidence level.
I need to think about the first question more, but in regard to the second question I think the issue of improving votage coordination between TOP's and GOPs is vital to address in a Standards project since the Standard applies to GOPs
Group
MRO NERC Standards Review Forum
Russel Mountjoy
Yes
VAR-001-4: R4 of VAR-001-4 seems to have a potential inconsistency between the parenthetical statement and the balance of the requirement. It is suggested that R4 be rewritten and simplified as follows: “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band for Generator Operators at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion”.[Note the SDT may want to review the concept of “mutually agreed upon” instead of the TOP’s discretion] Additionally, there needs to be a feedback loop from the GOP to the TOP regarding the voltage schedule. The following allows the GOP to provide feedback regarding the feasability of the schedule. A recommended R4.2 for VAR-001 : R4.2 The Generator Operator shall review the voltage or Reactive Power schedule and tolerance band provided by the Transmission Operator and inform the Transmission Operator of any conditions that would prevent the Generator Operator from complying with the schedule or tolerance band, along with the technical basis for that determination. The question that then comes up is, what does the TOP do if the GOP cannot comply with the schedule as presented? Recommended R4.3 to read: R4.3 If the Generator Operator is unable to comply with the voltage or Reactive Power schedule or tolerance band as provided by the Transmission Operator, the Transmission Operator shall (a) modify the voltage schedule within the parameters established in the documented policies and procedures established in R1, taking into account the Generator Operator’s limitations, or (b) exempt the Generator Operator from following the voltage schedule or tolerance band using the criteria established in R3.To allow for coordination of operations between Transmission Operators and Generator Operators, it is suggest the the words “that is mutually agreed” after the words “timeframe for making the changes” be added in requirement R6 of VAR-001-4. A recommended change to R6 of VAR-001 is as follows: “After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes that is mutually agreed, and technical justification for these changes.” That is, the change should normally wait until it can be rolled into a scheduled downtime event. VAR-002-3 The following change to the rationale for R2 of VAR-002-3 is suggested: Change “…or when the unit is too small to raise voltage” to, “…or when the unit is too small to control voltage within the tolerance band.” The implications of footnote 4 to requirement R2 of VAR-002 is unclear in that it is not identified what stablility limit is being referred to: that of the voltage regulator or a transmission system stablility limit. If it is a transmission system stability limit it is unclear how a generator operator would be aware of it and how the generator operator should change the unit capability accordingly. R2 should read, “Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule (within each unit’s capabilities4) as directed by the Transmission Operator.” R2.1 should read, “If the voltage drifts out of schedule, each Generator Operator shall notify its associated Transmission Operator when both of the following conditions are met: 1) the parameter being controlled has been outside the prescribed voltage or Reactive Power schedule tolerance band for 15 minutes; and 2) the GOP is

unable to return the parameter being controlled to within the voltage or Reactive Power schedule tolerance band." What's drifting is the grid, not the generators. R2.2 should read, "When a generator's automatic voltage regulator is out-of-service, the Generator Operator shall use an alternative method to control the generator reactive output to meet the voltage or Reactive Power schedule directed by the Transmission Operator, unless the TOP grants an exemption." The purpose of this change is to reference the process established in R3 of VAR-001.

No

The NSRF request that "within 30 calendar days of a request." (of R4) be modified to "within 30 calendar days or agreed upon schedule of a request." This will allow small GOPss to establish a working rapport with their TOPs, since many small GOPs may only have one subject matter expert that has this technical information. Please break the Standards apart into separate ballots. Since the applicable entities are different and the Standards cover different reliability related requirements. Please clarify within Measure 2, that not every day of "system studies" are required to be on-hand as evidence, if the study has not changed, as stated in the last sentence of measure 2.

Group

Tennessee Valley Authority

Brandy Spraker

No

Yes

TVA appreciates the effort that the ad-hoc group has put into this revision. For VAR-001-4, TVA supports the SERC OC Review Group comments. For VAR-002-3, TVA has the following two comments: In R1, please add language to ensure that the TOp has the authority to exempt a generator unit. M2 reads like another requirement or technical rationale. Timing requirements should be made clear in the requirement itself, and the measurement should only detail the evidence needed for the corresponding requirement.

Yes

For R2, TVA requests that notification be based on voltage readings taken no more often than 60 minutes and no less often than 30 minutes. The degree of signal conditioning allowed should be addressed, expressed as a maximum interval for averaging the variable on which the reading is based. The time that the Generator Operator has to notify the Transmission Operator of a voltage reading outside the published schedule would be no greater than 15 minutes. Paragraph 2.1 would then read: "Each Generator Operator shall take voltage readings no less often than every 60 minutes. Voltage readings shall be averaged over a time interval no greater than 30 minutes. The Generator Operator shall notify its associated Transmission Operator within 15 minutes or a length of time determined and communicated by the Transmission Operator when the following conditions are met: 1) the GOP is operating outside of the prescribed voltage or Reactive Power schedule tolerance band at the time of the latest reading; 2) the GOP is no longer able to return to its voltage or Reactive Power schedule; and 3) no previous notification has been made for the same continuous excursion out of schedule."

Individual

Christy Koncz

Public Service Enterprise Group

No

Yes

VAR-001-4 a. In R4, the standard provides the TOP discretion on whether the voltage schedule provided is on the high or low side of the GSU "at the interconnection point between the generator facilitry and the Transmission Owner's facilities to be maintained by each generator. As written, the

sentence makes no sense. The interconnection point MAY BE on the GSU high side, our it MAY BE at a point where the GO's interconnection facilities connect to the TO's facilities. In other words, the GSU low side, the GSU high side, and the interconnection point may be three different places for a particular generator. To avoid this confusion, we recommend that R4 should be rewritten as the first sentence in R4 in VAR-001-3, with the footnote omitted, as shown below: "R4. Each Transmission Operator shall specify a voltage or Reactive Power schedule at the interconnection between the generator facility and the Transmission Owner's facilities to be maintained by each generator." This change maintains the framework which has existed through three versions of VAR-001. b. With regard to the WECC exception, page 11 under the "Regional Variance" section states: "Regional Variance for the Western Electricity Coordinating Council from VAR-001-3 is retained." We understand it is the intent for VAR-001-3 to be retired, so this reference presents a potential reference problem unless all parts of VAR-001-3 are retired EXCEPT Section E, which contains the WECC Variance. We recommend that Section E in VAR-001-3 in its entirety be brought into VAR-001-4 so that the new standard stands alone. VAR-002-3 With the suggested modifications in VAR-001-4 above, we suggest the following changes to VAR-002-3: c. In R2, subpart 2.1, the phrase "If a GOP drifts out of schedule" should be modified to "If a GOP's generator drifts out of schedule." d. In M2, we have both questions and suggested modifications. i. We do not understand why, in this sentence is in M2 what the phrase "based on existing equipment at its facility" refers to. Is the team referring to the equipment for monitoring the voltage? If not, what is intended? ii. Delete the following: "Therefore, GOPs have the option to operate on a voltage schedule on either the high-side or convert the high-side schedule to a low-side schedule at the GOP's discretion. For units that monitor on the low-side/terminal voltage, Generator Operators shall provide evidence of the method of conversion from the high-side schedule to low-side monitoring." This is not longer needed based upon the changes recommended in VAR-001-4 to NOT provide the TOP with discretion on the reference point for the voltage schedule. iii. For the sentence "Evidence may include, but is not limited to Generator Operator logs, SCADA data, phone logs, and any other alarming notifications that would alert the Transmission Operator that both conditions were met," we suggest that "and" be changed to "or."
No
In M3, the phrase "no call is necessary" should be changed to "no notification is necessary."
The single paragraph in the white paper was not specific enough to warrant a comment. Those that have concerns should express them through suggested modifications of the SAR, which defines the project's scope.
Individual
Jack Stamper
Clark Public Utilities
No
No
Yes
I do not see why there is a need for a fifteen minute cutuoff if the status has been restored. The requirement should allow 30 minutes to provide notification of a stauts change and if at any time during the 30 minutes the status is restored there should be no notification required. Under the current language, if the status is restored at 16 minutes, the GOP then needs to notify its TOP within the next 14 minutes that that generator status changed but returned to normal. How is that improving reliabiilty? It does not improve reliability. The purpose of the 30 minute delay is to allow a GOP to breifly investigate why the status or capabilty has changed and if the solution is at the plant, fix it quickly. I believe 30 minutes is a reasonable amount of time before the GOP needs to notify its TOP that a status or capability change has occured. The GOP will still attempt to fix it but has now notified the TOP. Whether the GOP fixed it in 2 minutes or 25 minutes it still does not need to notify the TOP until 30 minutes. If the problem is fixed before 30 minutes, the event is a non-event as far as the TOP is concerned (except that the TOP knows that it was briefly broken and is now fixed). The TOP is not going to change its operations or invoke some emergency plan for a generator that had a status or capabilty issue for 10 or 20 minutes but is now fine.

Individual
Michael Falvo
Independent Electricity System Operator
Yes
We question the need to ask this question when the consolidated standard is already posted for commenting and balloting. The intent of posting a SAR for comment is to seek industry's input on the need and scope of a proposed standard development/revision project. Posting the standard for balloting at the same time suggests that there is already a foregone conclusion on the need and the scope for this project , and that the industry's input on SAR would seem irrelevant. The IESO understands that posting a SAR and the draft standards for comment at the same time can improve standard development efficiency, and we support it to the extent that sufficient technical information has been obtained to facilitate the development of a draft standard at the informal outreach stage. However, we are very concerned about the fact that the industry was asked to ballot the draft standard when the need and scope of the draft standard have not been commented on and supported by the industry, and the standard itself has not been drafted by a formal standard drafting team. Such an approach appears to: a. Deviates from the normal standards development process as presented in the Standards Process Manual (SPM); b. Contradicts and perhaps violates the intent of the established standard development process and ANSI principles to have new and revised standard formally developed through an open and inclusive process before being presented to the RBB for balloting. The industry is being asked to ballot a set of standards that has not been formally developed. This concept appears to be fundamentally flawed. We propose that the SDT convey our concern to the NERC senior management and the Standards Committee. We further suggest that NERC and the SC evaluate alternative approaches or make revisions to the SPM to provide the needed flexibility that can further improve the efficiency in standard development if certain elements in the existing SPM are assessed to restrict such improvements.
Yes
VAR-001-4 a. It is unclear on the main objective and the target reliability outcome of Requirement R1, and the intent of the proposed changes in relation to the directive in P. 1868 in Order 693. We interpret R1 to require a TOP to have documented policies or procedures in place that can be implemented to establish, monitor, and control voltage levels and Reactive Power flows (Mvar flows) within limits as defined in Parts 1.1 to 1.3. However, Part 1.1 requires that the policy/procedure shall include criteria used in system assessments. It is unclear as to what "system assessments" means? Does it mean assessments of the TOP area's reliability performance with respect to the voltage levels and Mvar flows and any limits (SOLs, IROLs, reactive capability)? Or does it mean the system assessment that yields the "limits" (SOLs, IROLs, reactive requirements, etc.) which provide the target and guideline for the establishment, monitoring, and control of voltage levels and Mvar flows? It is also unclear as to what the "criteria of the assessments" means in the second sentence of Part 1.1, especially in relation to "established steady-state limits, voltage stability limits, etc. if the answer to the above question is that the assessments were meant to yield the "limits", then there is a confusion as to what limits are intended to be developed in relation to the "established" limits. In Order 693, P. 1868, FERC directs the ERO to modify VAR-001-1 to include more detailed and definitive requirements on "established limits". However, it is unclear what this directive really means. Does it mean more details and definitive requirement on stipulating voltage and reactive requirements with respect to established limits (SOLs, IROLs, voltage level, etc.) or does it mean more details on limits (boundaries) of the interconnection voltages as implied by Requirement R8 of the existing VAR-001 standard? Requirement R1 does not provide this clarity since Part 1.1. refers to "established steady-state limits, voltage stability limits", which is different than the "established limits" presented in the R8 of the existing VAR-001 standard. It is our understanding that as a general practice, a TOP will assess if there exists any reliability concerns that can be caused by voltage levels and instability to develop operating limits (SOLs or IROLs) to ensure reliable operations. The operating limits may be expressed in voltage level, pre and post-contingency power flow level, reactive support requirements or any combination of the above. The operating limits so established will provide a linkage between the SOL, voltage level and reactive power capability/reserve requirement either explicitly or implicitly. System Operators will monitor the key parameters including

voltage level, power flow level and reactive power flow/reserve/capability to meet the SOL boundary conditions. Requirement R1 as presented does not provide any clarity as to what is it that in the practice that a TOP is required to meet. Requirement R1 as presented is unclear on its objective and the exact actions required of the Responsible Entity as there are a number of "criteria" and "limits" in the main requirement and its Part 1.1 that are confusing and subject to different interpretation. R1 as presented will leave a Responsible Entity not knowing what it needs to do to meet Requirement and its reliability objectives. We suggest the SDT to revise R1 and its parts to clarify its intent, especially on the who, the specific actions and expected outcome according to the results-based principle and guideline. Note that with respect to Part 1.1, Measure M1 asks for evidence that proves voltage is currently being monitored. Such evidence may include, but is not limited to: 1) proof that points are telemetered, 2) alarms are functioning, and 3) during events of low or high voltage the policies and procedures are being followed to respond to control voltage levels. These examples of evidence do not reflect the scope and depth of R1 and Parts 1.1 (the criteria and the assessment parts). b. FERC directive 1855 directs NERC to include Reliability Coordinator as applicable entities and include a new requirement(s) that identifies the reliability coordinator's monitoring responsibilities. In the Informal Consideration specific to this directive presented in the White Paper, it is indicated that: "Although some entities in Texas provided feedback that certain RCs perform functions equivalent to a TOP, the informal development group did not expand VAR-001 to give parity to TOPs and RCs." R2 as presented appears to go beyond the FERC directive that RC be included to be assigned the "monitoring responsibility" as R2 now requires the RC to "….perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1". The inclusion of RC in this requirement is also inconsistent with the view presented in the Informal Consideration with respect to parity between TOPs and RCs. Parts 2.1 and 2.2 stipulates a number of tasks for the TOPs with respect to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow, and to ensure that sufficient reactive resources have been scheduled to meet acceptable day-ahead voltage limits identified in Requirement R1. These tasks do not involve the RC. It thus raises a question on the need for including RC in the main requirement when it is not required to take further actions to assure its assessment of "sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions" can be fulfilled in real-time operations. We believe the inclusion of RC in this requirement is inappropriate, or if there is a compelling reason to include the RC, then Parts 2.1 and 2.2 are insufficient to assure the RC's assessment can be supported in real-time operations. c. Requirement R2, Part 2.1 stipulates that: "Each Transmission Operator shall operate or direct the real-time operation of devices necessary to regulate transmission voltage and reactive flow necessary to regulate transmission voltage and reactive flow which may include…" We do not understand this requirement as it contains two sets of "necessary to regulate transmission voltage and reactive flow". If this is a typographical error, please correct it. d. We do not have any concerns or comments on R3 and R4 as presented, but suggest that their order be reversed since the exemption criteria (R3) should appear after the overarching requirements for GOs to maintain a voltage or Reactive Power schedule and tolerance band. e. R5: we suggest to change the word "know" to "monitor". This provides an active approach, which is appropriately reflected by the wording in Measure M4. f. In the Compliance Section, there is no requirement for the RC to retain evidence for Measure M2. Further, there is no requirement for the TOP to retain evidence for Measures M5 and M6. g. VSL for R1: There is no explicit requirement in R1 for the TOP to provide a copy of the assessment criteria to its RC or neighbor TOPs since the assessment criteria are supposed to be included in the policy or procedure document. The Low VSL thus serves no purpose whatsoever. Further, from the standpoint of meeting the intent of Requirement R1, there is little to no difference between having documented policies or procedures which do not include any of the elements stipulated in Parts 1.1 to 1.3, and having no documented policies or procedures at all. In the former case, the documented policies or procedures provide absolutely no value, and hence is it a total violation of the intent of R1. We suggest to remove the Low VSL and the High VSL, and keep the Moderate VSL and revise the Severe VSL to include the condition presented in the High VSL as an "OR" condition under the Severe VSL. h. VSL for R2: Throughout R2, there are not specific requirements for having policies and procedures implemented to have sufficient Mvars. R2 requires the TOP and RC to perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions. Part 2.2 stipulates the requirements for scheduling reactive resources to meet

the reactive requirements resulting from day-ahead assessments. Part 2.1 stipulates the requirement to operate or direct the real-time operation of devices necessary to regulate transmission voltage and reactive flow. While the Moderate VSL which address non-compliance with Part 2.2 and appears to be reasonable, the Severe VSL does not correspond to how Part 2.1 is presented. Further, the condition that “A lack of real-time operations is also severe.” seems irrelevant to Part 2.1 when it comes to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow. There can be no lack of real-time operations, but a TOP may totally ignore the operations or directing the operations of devices necessary to regulate transmission voltage and reactive flow. Finally, there is no VSL for the RC failing to meet R2. Hence, RC is assigned a responsibility but its compliance is not measured and there is no VSL to determine its non-compliance. i. VSL for R5: The conditions in the Moderate and High VSLs are irrelevant to the requirement. R5 requires a TOP to know (monitor) the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. The Moderate VSL makes reference to a “stable area”, which is totally irrelevant and out of context of R5. In the High VSL, the TOP not knowing “the status of important equipment in weaker areas that were identified in assessments as part of R1.” are also irrelevant and out of context of R5. Finally, there is no Severe VSL. It begs the question on: what constitutes a total failure to comply with Requirement R5? j. VSL for R6: The Low VSL should have an “is”, not an “are”. Also, there is no Severe VSL and hence there is no condition to constitute a total failure to comply with Requirement R6. VAR-002-3 k. Measure M2: A good part of M2 presents the scenarios where a Generator Operator may not be able to meet voltage schedule or comply with the TOP’s directive, and how a GOP may mange the situations. The description part does not belong to a Measure, and should be moved to the Background Information Section that a Results-based standard template has made provision for. l. Measure M3: the latter part of M3 is not presented in a manner to require the evidence to demonstrate compliance. We suggest M3 be revised to: The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any of the changes identified in Requirement 3, or evidence that the status had been restored within the first 15 minutes of such change. m. For all Measures, there are no examples of evidence provided. It will be appropriate if after each of the “evidence”, additional wording “such as log, recording, or other documents” so as to be consistent with the way measures are presented in other standards. n. Evidence Retention: It will be appropriate to reference the Measure Number for the GO’s and the GOP’s data retention requirements.
No
NERC’s Reliability Issue Steering Committee (RISC) is charged to address emerging reliability issues and recommend preferred approaches to manage such issues. Whether or not the TOP/GOP voltage coordination issue should rise up to a risk level that warrants special attention by the industry, and whether the appropriate way to address this issue in a standard project will be best evaluated and determined by the RISC. We suggest that the SDT nominate this issue to the RISC for its deliberation.
Individual
Martin Kaufman
ExxonMobil Research and Engineering
No
Yes
The SDT should revisit VAR-002-3 Requirement R2 (including sub-requirements) and Measure M2. Generators should be required to operate in automatic voltage control mode and implement a setpoint consistent with the voltage target (schedule, etc.). The current requirement combined with the measure presents a framework that opens new reliability gaps. For example, in the new framework, if the voltage in a localized area goes low, the generators that notice the drop first are encouraged to deviate from actions that are predictable and take independent action to alter their control systems to provide the system more VARs. This presents three problems: 1) The ideal situation would be for the Transmission Operator to allow sufficient time for all of the generators under its control to automatically respond and then issue specific dispatch instructions to those units that are optimally able to resolve the issue: 2) When numerous generators take independent action, it’s questionable as

to whether the Transmission Operator's real-time evaluations of system contingencies are accurate b/c the assumptions related to how a generator will respond are no longer accurate and are unpredicatable due to the independent actions taken by GOPs; and 3) The generators that are slower to notice the voltage dip will likely not alter their control system parameters; allow for the automatic voltage regulator to respond (at which point adequate voltage will likely be restored); and, potentially, these units will have an economic advantage over similarly sized units because they are supplying less VARs than the units that took independent action (If you generate more VARS you can generate less Watts at maximum MVA on the generator capability curve). Additionally, Measure M2's statement "For units that monitor on the low-side/terminal voltage, Generator Operators shall provide evidence of the method of conversion from the high-side schedule to low-side monitoring" creates a hidden defacto requirement for those units that control their units based on the low-side of the GSUT. It's unclear how possession of a conversion method without any clear criteria for what should be included in the conversion method could 1) improve system reliability and 2) be evaluated by an auditor during a compliance audit. The majority of generators on the grid are controlled on the low-side of the GSUT. Under normal conditions, since generator's operation is validated when the unit is brought on-line and voltage schedules should consider N-1 and credible N-2 contingencies, the voltage drop across and losses through the GSUT should have minimal impact (on an individual generator basis) on the voltage quality of the grid. If the technical concern is based on the aggregated impact of GSUTs' voltage regulation varing with loading, then criteria for a methodology should be developed for those units that do not have the capability to monitor the high side voltage in real-time. However, industry input feedback indicates that only a minority of generation units that control on the low-side of the GSUT do not have high-side monitoring. The majority of units that control their AVR based on the low-side of the GSUT do see the high-side voltage and would notify the Transmission Operator of a deviation from the voltage schedule lasting longer than 15 minutes (VAR-002 R2), which would allow the Transmission Operator to direct the Generator Operators under their control to correct the deviation in a predictable and economic fashion AND would allow the Transmission Operator to calibrate any assumptions / variables necessary in their real-time models so that the real-time evaluations reflect accurate input data. Additionally, we would suggest that the models used by Transmission Operator to satisfy requirements R1 and R2 of the draft VAR-001 standard should account for the GSUT's voltage regulation characteristics under normal system operation in order to accurately reflect that Generators are controlling the low-side bus.
If the Transmission Operator has not reached a pre-defined system operating alarm / limit and the Generator Operator is already operating with its automatic voltage regulatory in voltage control mode, what reliability concern is alleviated by the Generator Operator notifying the Transmission Operator that the voltage on the Generator Operator is monitoring has drifted off of schedule? The majority of units on the grid are unable to move the grid voltage by themselves, which is why VAR-002 requires that the aggregate operate in voltage control mode, and the likely cause of the event is a system contingency that the Transmission Operator has: A) planned for in their development of operating limits and is still within their pre-defined operating limits; B) has not planned for and is still within their pre-defined operating limits; or C) has not planned for and is outside of their pre-defined operating limits AND should be the only one taking independent action so that the system's response to the Transmission Operator's actions is predictable.
Individual
David Jendras
Ameren
No
Yes
For the most part we agree with the GS Subcommittee comments but we also have included are our specific comments below.
Yes
(1) R2 – We request the SDT to clarify this requirement. As it is written we believe operators may be confused of knowing when the new "15 minute" time period will start. Since it seems (under the draft) to be OK, that we can drift in and out of the Voltage Schedule for several hours if the operator

thinks the machine can get back on the VS later. How will our operators know when the 15 minute report trigger has occurred? (2) R2 – We believe the 15 minute time period is too short for mandatory reporting to the TOS. We ask the SDT to consider that currently there is no specific time period, and therefore we will need to modify our procedures accordingly. (3) Whether in VAR-001 or VAR-002 temporary exemptions are not appropriate. There may be circumstances that a generator should be declared exempt consistent with VAR-001 Requirement 3. These type of exemptions should be declared and documented outside of any particular period of inability to maintain the voltage schedule. Rather than have temporary exemptions if a generator were unable to operate in AVR or if operating in AVR the generator could not operate in the band of the voltage schedule, language should reflect that the notification of the inability is made to the TOP and the TOP will provide further instruction for operation, i.e. a set VAR output, a specific power factor, to the unit D-curve, etc. This would ensure that even if a generator could not meet the voltage schedule they should be as near the voltage schedule as is possible. Being exempted might give the generator the notion, "Since I am unable to get to my voltage schedule and I am therefore exempt, it does not matter how I operate." That should never be the case. (4) Whether in VAR-001 or VAR-002 temporary exemptions are not appropriate. There may be circumstances that a generator should be declared exempt consistent with VAR-001 Requirement 3. These type of exemptions should be declared and documented outside of any particular period of inability to maintain the voltage schedule. Rather than have temporary exemptions if a generator were unable to operate in AVR or if operating in AVR the generator could not operate in the band of the voltage schedule, language should reflect that the notification of the inability is made to the TOP and the TOP will provide further instruction for operation, i.e. a set VAR output, a specific power factor, to the unit D-curve, etc. This would ensure that even if a generator could not meet the voltage schedule they should be as near the voltage schedule as is possible. Being exempted might give the generator the notion, "Since I am unable to get to my voltage schedule and I am therefore exempt, it does not matter how I operate." That should never be the case. (5) M2 – A "30 minute" time period is allowed in M2 that appears to not be included, explained or mentioned in R2, please clarify. (6) We believe the TOP should set the reporting time period and it should not be set in the Standard. Our TOP has told us is the 15 minuet reporting is excessive and not necessary for reliable operation of the transmission system. (7) M2 – The first sentence of M2 requires the GOP to "make all attempts to operate within the tolerance bands provided by the TOP". We ask the SDT to explain from a generator perspective and provide an example for how this can be proven to an auditor?
Individual
Chris de Graffenried
Consolidate Edison Co. of NY, Inc.
Agree
Northeast Power Coordinating Council (NPCC) - All comments.
Individual
David Burke
Orange and Rockland Utilities, Inc
Agree
Northeast Power Coordinating Council (NPCC) - all comments.
Group
FirstEnergy
Larry Raczkowski
No
No
Yes
FE believes that #2 of Part 2.1 of Requirement 2 needs clarity. Since both conditions of Part 2.1 must be met, there should be a time parameter associated with #2. Otherwise, unless something

catastrophic happens, #2 will always be true, ie, we expect to be back on schedule at some time. We propose the folloing for #2 of Part 2.1 of Requirement 2 2) the GOP is unable to return to its voltage or Reactive Power schedule within 30 minutes of operating outside the prescribed schedule.
Individual
Michelle R D'Antuono
Ingelside Cogeneration LP (Occidental Chemical Corporation)
Yes
Ingleside Cogeneration LP supports the changes that have been made to both VAR standards. First, we agree that the removal of FERC's two LSE-related directives can be justified using the Paragraph 81 criteria. Directive 1858, which calls for LSEs to take on Reactive Power responsibilities consistent with PSEs, can be retired (as can VAR-001-2 R5) since those actions are already governed by the OATT. Similarly, the directive that LSEs maintain power factors within a given range is a normal part of interconnection agreements. Since both the OATT and pro-forma interconnection agreements are under regulatory control, reliability requirements are an unnecessary redundancy. Secondly, we agree with the need to include precise language in the measures to assure that Compliance Enforcement Authorities are looking for situations that present true risk to the BES. For example, the measure for VAR-002-3 R2 clearly accounts for those configurations where the GOP monitors voltage and reactive power flows at the generator output instead of the interconnection. In these cases, the CEA needs to understand that a conversion mechanism is sufficient – and not insist that high-side voltage and reative power monitoring is specifically required.
Yes
In particular, Ingleside Cogeneration would like to see the changes made to VAR-002-3 R3 take effect. We agree that there needs to be a level of tolerance around the communication of an AVR outages – those that are restored within 15 minutes pose no viable threat to the BES and only serve to distract the Transmission Operator from more pressing tasks. Although it does not change our vote to approve both of the VAR standards, we would like to suggest that a referece could be added under R1 to capture the same 15 minute criteria. Otherwise it seems possible that any uncommunicated AVR outage will violate R1, even if compliant with R3.
No
Ingleside Cogeneration would hesitate to call for more standards development activity related to TOP/GOP voltage and reactive communication. In our view, the issue does not appear during normal and semi-normal operations (i.e.; the generator is able to maintain voltage and reactive power within tolerance without exceeding its Facility Ratings). It may be a different story during an event where transients driven by the external network exceed a generation facility's capabilities. Since the proper action to take relies on the character of the transient – whether it is of long-duration/short-duration – and the topology of the local system, and the availability of other nearby reactive resources, the GOP can only take best-effort steps to maintain output to the TOP's schedule. We rely on guidance from the TOP if there are actions that must be taken beyond that point. For example, if a GOP were to make a change to a voltage setpoint outside of the threshold range without the TOP's guidance, the impact to the local system may actually worsen. Ingleside understands that during an emergency, the TOP may be otherwise engaged with many other operating entities – and may need the GOP to take helpful actions to stabilize the situation without direct supervision. However, there needs to be some pre-developed universal criteria in place before we would be comfortable proceding in this direction. In our view, this is an issue best taken up in a NERC sub-committee or task force – not a SDT.
Individual
David Austin / Ed Mackowicz
NIPSCO
Yes
We would like to see this project divided into two separate projects/ ballots. We are fine with the proposed VAR-002-3, but have some concerns with VAR-001-4. Ultimately, this means we must vote

negative for both standards instead of just one.
Yes
1. VAR-001 causes concern for the uncertainty of how to come up with a basis of how we plan operations. Is our performance over the last "x" years enough to justify no change, or do we need to study for voltage and VARs for the day(s) ahead and in real time (two extremes)? 2. There are discrepancies or vagueness between interpretations in new VAR standards and other standards like TOP. Which one trumps the other? 3. In general, the individual standards can be made to work. However, the interdependencies and the ability to go off on a tangential path between VAR, TOP and other related standards is troublesome. While each standard may be good as a solo act, they do not make a symphony together. RECOMMENDATIONS: A. All of the standards should be placed on a matrix so that interdependencies are identified and coordinated in application and measurement. B. The standards need to be stable over time as opposed to new ones being voted on before the previous one is implemented. C. A multi-year process where interdependent standards are adjusted and implemented in unison will yield a productive effort by the industry towards being more reliable rather than concentrating on avoidance of violations.
No
Individual
Brett Holland
Kansas City Power & Light
No
Yes
In VAR-001-4, depending on what periodicity and type of studies required in R2, this could overly burdensome to the registered entities to show evidence of compliance.
No
We would add that any proposed improvement to the voltage coordination between the TOPs and GOPs is a suggested guidance or level of expectation.
Group
Salt River Project
Bob Steiger
No
No
No
No comments from SRP
Individual
Lynda Kupfer
Puget Sound Energy
No
Yes
VAR-001-4 Comments Requirement R2 appears to be a mix of planning and operational processes. Since the main section of the requirement only addresses the planning process, part 2.1, which

addresses operational issues, seems out of place. In addition, since part 2.2 goes back to addressing planning processes, part 2.1 also seems out of sequence. This could be addressed by revising the main section of requirement R2 to address how the planning and operational aspects interrelate and then reordering parts 2.1 and 2.2. Alternatively and preferably, part 2.1 could be a stand-alone requirement, since it also addresses complying with the limits under the processes required by requirement R1. The drafting team should consider deleting the language "and direct the Generator Operator to comply with the schedule in automatic voltage control (the AVR is in service and controlling voltage)" from part 4.1 of requirement R4. Since VAR-002 requires the GOPs to operate in AVR mode and to follow the voltage schedule, the quoted language is both redundant and administrative in nature. Minor conforming changes would be necessary in VAR-002 (replacing the phase "as directed" with "provided" where that standard references the schedule should be sufficient to address this change). The last sentence of measure M5 should be deleted since it is redundant with EOP-008-1, which requires TOPs to have backup control center functionality available to address the loss of primary control center functionality. Losing the ability to monitor voltage would be a loss of primary control center functionality that is addressed by EOP-008-1.
Yes
VAR-002-3 Comment R2.1 condition 2 is vague and unclear how this should be interpreted "…no longer able to return…" What if you knew you were going to be able to return to schedule tomorrow? Would you need to report?
Individual
Herb Schrayshuen
Self
No
Yes
VAR-002 footnote (3) on page 6 offers a definition of the phrase "voltage or Reactive Power schedule." VAR-001 does not define "voltage or Reactive Power schedule." The term "voltage or Reactive Power schedule" should be defined for both standards. The voltage and Reactive Power (VAR) output of a generator is adjusted by several methods. The requirements in the VAR-001 Standard should state in terms of an action oriented result, what is expected. In VAR-002 M2 provides situations where a Generator Operator may not be able to meet a voltage schedule or comply with the TOP's directive. The description does not belong in a Measure, and should be moved to the Background Information Section of the Results-based standard. The proposed requirements in both VAR-001 and VAR-002 should be carefully reviewed to ensure they meet the expectations of a results based standard.
No
Group
Tacoma Public Utilities
Michael Hill
Yes
Concerned about the significant overlap in these standards vs: their long term accuracy.
Yes

VAR-001: -R3, Concern over the TO setting the criteria for when an AVR may be out of service. Could look to the current exceptions table for guidence. -R4 is poorly written and needs editing. Are we to specify the schedule a the point of interconnection, GSU hi side, GSU lo side, or a combination? Also, R3 allows the TO to exempt when the AVR must be in service, but R4.1 doesn't reference this exemption. VAR-002: -R1 confilcts directly with VAR-001 R4.1. Again, I read VAR-001 R4.1 to state the TO is giving the GO a directive to always be in AVR mode. No room is given for exceptions, (could easily correct this).
No
Individual
Kayleigh Wilkerson
Lincoln Electric System
MRO NSRF
No
Yes
Although supportive of the drafting team's efforts, LES is concerned with the removal of the FERC-approved interpretation previously appended to VAR-002-2b. Per the Interpretation, the Transmission Operator is permitted the option of directing the Generator Owner to operate the AVR in the constant Pf or constant Mvar modes rather than the constant voltage mode. In consideration that Requirements R1 and R2 of VAR-002 have not changed significantly, it is difficult to discern whether or not the Interpretation still applies. To ensure clarity going forward, LES recommends the interpretation either be appended to VAR-002-3 as well or else the drafting team further modify the requirements and/or measures to allow the TOP to direct the GO to run in a mode other than constant voltage.
Group
SERC OC Review Group
Catherine Wesley
Yes
There is a general concern with this proposed standard that it will create further administrative burden for the TOP/RC as well as the back office staff. Additionally, the opportunity exists that the number of calls between the GOP and TOP will increase without materially enhancing BES reliability. Further, how would these standards be used to evaluate the compliance of a unit which has their AVR taken off auto for testing?
Yes
VAR-001-4 Comments: R1.1.2. Each Transmission Operator shall Delete: "provide a copy of these documented policies or procedures to adjacent Transmission Operators" make plans available with a written request so entities requiring documents have access. R1.1.3. Each Transmission Operator shall Delete:"provide a copy of these documented policies or procedures to its Reliability Coordinator." make plans available with a written request so entities requiring documents have access. R2. Each Transmission Operator and Reliability Coordinator shall perform assessments on their respective areas in order to ensure sufficient reactive resources are available Delete: "for scheduling" to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1. R2.2.2. As a result of the assessments, each Transmission Operator shall ensure that sufficient reactive resources Delete: " have been scheduled" Add: "are available" to meet acceptable day-ahead voltage limits identified in Requirement R1. Sufficient reactive resources may include, but is not limited to reactive generation scheduling; transmission line and reactive resource switching; and controllable load. M2 (excerpt): During a "real-time event" where voltage must be adjusted, a Transmission Operator shall show evidence to show directions were given to adjust the operation of capacitive and inductive resources. It is requested that the SDT provide additional

clarification what is meant by “real-time event” and whether it refers to normal operations or disturbances. SDT Question: How does the SDT anticipate this measure be used to evaluate the compliance of a unit which has their AVR taken off auto for testing? M3 (excerpt): For temporary exemptions, evidence showing the exemptions were granted must be provided. If the exemptions were given verbally from the Transmission Operator, the phone recordings or emails commemorating the phone call must be provided. For temporary exemptions, the evidence of communication must also include the timeframe for how long the exemption will last. We believe that this measure will increase the administrative burden placed on the TOP/GOP in real-time. R4.4.1. The Transmission Operator shall provide the voltage or Reactive Power schedule and tolerance band to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode. Delete:”(the AVR is in service and controlling voltage).“ R5. The Transmission Operator shall know the status of Delete:”all transmission” Add: “ BES” Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. Request that the SDT review R5 to ensure that it is not a duplicative of a TOP standard. M5. The Transmission Operator shall have evidence to show Reactive Power resources are being monitored. Evidence may include, but is not limited to screen shots of EMS/SCADA data, alarms, and phone logs. In the event the monitoring system does not work, each Transmission Operator should have a protocol in place to show these resources are being monitored. Request the SDT to add further clarification for AVR and PSS. VAR-002-3 Comments: 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) unless Delete:”the Generator Operator has notified the Transmission Operator of one of the following: “a generator has been has been exempted from operating in the AVR voltage control mode by the Transmission Operator or the Generator Operator has notified the Transmission Operator of one of the following: M1. Add: "Unless exempted" the Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to operate a generator in the automatic voltage control mode as specified in Requirement 1. 2.1. If a GOP drifts out of schedule, each Generator Operator shall notify its associated Transmission Operator within 15 minutes when both of the following conditions are met: 1) the GOP is operating outside of the prescribed voltage or Reactive Power schedule tolerance band for Change from 15 to 30: 30 minutes; and 2) the GOP is no longer able to return to its voltage or Reactive Power schedule. M2 excerpt: 1) Communications with the TOP when the Generator Operator was operating outside of the prescribed voltage or Reactive Power schedule tolerance band for 30 minutes Delete: “or less the 30 minutes allow for 15 minutes to call and 15 minutes to be outside of the tolerance band)” AND Generator Operator is no longer able to return to its voltage or Reactive Power schedule; 2) R3. Request a threshold be defined for the term “capability change” M3. The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any of the changes identified in Requirement 3. If the status has been restored within the first 15 minutes, no call is necessary Delete: "therefore, if a status on Reactive Power resource has changed, and that change lasts greater than 15 minutes, the GOP must notify its associated TOP within 30 minutes of when the change first occurred.”
Yes
We are unclear on how the draft time period was arrived at. Without that information it is difficult to compare time periods. The concern is the potential administrative burden placed on the TOP.
Strong communications between TOPs and GOPs is essential for reliability of the system. The concern that we have centers on the potential administrative burden that is placed on the TOPs and GOPs. The comments expressed herein represent a consensus of the views of the above named members of the SERC OC Review Group only and should not be construed as the position of the SERC Reliability Corporation, or its board or its officers.
Group
Dominion NERC Compliance Policy
Randi Heise
No
Yes
VAR-001-4 • R1.1.2 amd R1.1.3 – Dominion suggests addition of the words ‘if requested”. This will

lessen administrative burden. • R2.1; “necessary to regulate transmission voltage and reactive flow” seems to be listed twice in this requirement, please clarify. • R3.1; Dominion suggests replacing “it” with “the Transmission Operator” • M3; Dominion suggests replacing “its” with “the Transmission Operators” • R6 - To allow for coordination of operations between Transmission Operators and Generator Operators, it is suggest the the words “that is mutually agreed” after the words “timeframe for making the changes” be added in requirement. VAR-002-3 • R1 – Dominion suggests requirement be revised to read “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) unless the Generator Operator has been exempted from operating in the AVR voltage control mode by the Transmission Operator or has notified the Transmission Operator of one of the following: • M1- Dominion suggests measure be revised to read “Unless exempted the Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to operate a generator in the automatic voltage control mode as specified in Requirement 1” • R2 - We suggest inclusion of a footnote to indicate that GOP is expected to be able to maintain voltage schedule as long as doing so would not violate its reactive capability curve or power factor requirement (as prescribed in other reliability standards such as FAC-001-0,. MOD-025-2 and MOD-026-1 or agreements such as an interconnection agreement). • R2.1 – Dominion suggests deletion of the words “If a GOP drifts out of schedule” because inclusion of these words could give the impression that an intentional deviation nullifies this sub-requirement. We do not believe this is the intent and therefore suggest that the sub-requirement read “Each Generator Operator shall notify its associated Transmission Operator within 30 minutes when both of the following conditions are met: 1) the GOP is operating outside of the prescribed voltage or Reactive Power schedule tolerance band for 30 minutes; and 2) the GOP is no longer able to return to its voltage or Reactive Power schedule. • M2- Dominion does not agree with proposed language . GOP should be required to monitor and maintain voltage (high or low side of GSU) as specified by TOP in VAR-001-4@R4. • R3 & M3 - Dominion does not see value in the changes but do not oppose the revisions. In both VAR-001-4 and VAR-002-3 standards; GOP and TOP acrnomyns are used, Dominion suggests these acronyms be either spelled out or be updated to use GOP and TOP throughout the documents.
Yes
Dominion does not believe the additional granularity (15 minutes to determine and 15 to notify) is necessary or improves reliability. We believe the previous requirement (to inform within 30 minutes) is superior to the prosoed revision.
Dominion appreciates the IVG’s concentrated efforts to meet FERC Directives outlined in FERC Order No. 693 in suport of generator timeframes that ensure appropriate generation operation to maintain network voltage schedules. Dominion believes that the language and timeframe in VAR-002 provides for the generator to have adequate time to correct voltage drift and in the occasion where the cause of the voltage status change needs to be determined and then resolved, the timeframe of 30 minutes provides adequate time for the generator to notify the Transmission Operator.
Individual
John Canavan
NorthWestern Energy
Yes
It appears VAR-001-4, R5 is negated by VAR-002-3, R2 and R3. These standards should be coordinated with each other before they are submitted for a vote. Also we believe VAR-001-4, R2, requires additional clarification. Also, there are some overlaps within these new standards when compared to current NERC standards in place. For example FAC-014 and TOP-002. An overlap exists in establishing limits in accordance with the RC SOL methodology and the new RC SOL Methodology includes establishing limits for voltage stability and steady state voltage limits. TOP-002 states that the Transmission Operator shall perform seasonal, next day, and current day BES studies. Because of the overlaps we fear that entities could be subject to Double Jeopardy.

Individual
Scott Berry
Indiana Municipal Power Agency
Yes
Indiana Municipal Power Agency (IMPA) believes that there is some overlapping of requirements when comparing VAR-001-4 R1 to TOP-004-2 R6. IMPA recommends removing the common requirements (such as, monitorind and controlling voltage levels and real and reactive power flows-including additional requirements) from R1 of VAR-001-4. IMPA also believes that VAR-001-4 R5 can be deleted because TOP-006-2 R1 and R2 perform the same function. In addition
Group
Oklahoma Gas and Electric Co
Terri Pyle
Agree
Southwest Power Pool Standards Review Group.
Group
PPL NERC Registered Affiliates
Brent Ingebrigtson
No
No
These comments are submitted on behalf of the following PPL NERC Registered Affiliates (PPL): Louisville Gas and Electric Company and Kentucky Utilities Company; PPL Electric Utilities Corporation, PPL EnergyPlus, LLC; and PPL Generation, LLC, PPL Susquehanna, LLC and PPL Montana, LLC. The PPL NERC Registered Affiliates are registered in six regions (MRO, NPCC, RFC, SERC, SPP, and WECC) for one or more of the following NERC functions: BA, DP, GO, GOP, IA, LSE, PA, PSE, RP, TO, TOP, TP, and TSP. Comments: VAR-001: 1. The rationale statement for R1 of VAR-001 says that it, “will allow each Transmission Operator (TOP) to establish its own policies and procedures,” regarding voltage schedules and tolerance bands. This wording does nothing to prevent specifying an unreasonably-tight bandwidth (e.g. +/- 0.5%), as some parties are now doing. The PPL NERC-Registered Affiliates suggest that R1.1 end as follows, “…voltage schedules along with associated tolerance bands of not less than 1.5% of the schedule voltage unless technically justified.” There may be some resistance to making the standard prescriptive, but it’s not a burdensome requirement, and it would be unfortunate to update the standard without addressing known abuses of the present version. 2. The statement, “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band (at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion) at the interconnection point between the generator facility and the Transmission Owner's facilities,” in R4 of VAR-001 has a semantics glitch in that there is just one interconnect point. That is, mandating control at the interconnection eliminates any discretion in making the high vs. low-side selection. PPL suggests saying instead, “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band, at the agreed upon metering point to which the GOP has access.” This will typically be either the transmission bus or the generator terminals. If the TOP specifies this as the TO’s “transmission bus”, the TO should be required to make the same voltage point used by the TOP available to the GOP to ensure both are seeing the exact same voltage. Additionally, there needs to be a feedback loop from the GOP to the TOP regarding the voltage schedule. This does not mean we want to spark a debate every time a schedule is provided, but simply add a step that allows a GOP to provide feedback regarding the feasibility of the schedule. A recommended R4.2: R4.2 The Generator Operator shall review the voltage or Reactive Power schedule and tolerance band provided by the Transmission Operator and inform the Transmission Operator of any conditions that would prevent the Generator Operator from complying with the

schedule or tolerance band, along with the technical basis for that determination. The question that then comes up is what does the TOP do if the GOP cannot comply with the schedule as presented? Recommended R4.3: R4.3 If the Generator Operator is unable to comply with the voltage or Reactive Power schedule or tolerance band as provided by the Transmission Operator, the Transmission Operator shall (a) modify the voltage schedule within the parameters established in the documented policies and procedures established in R1, taking into account the Generator Operator's limitations, or (b) exempt the Generator Operator from following the voltage schedule or tolerance band using the criteria established in R3. 3. PPL would like to see R6 of VAR-001 changed to, "After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes that is mutually agreed, and technical justification for these changes." That is, the change should normally wait until it can be rolled into a scheduled downtime event. VAR-002: 1. PPL suggests changing, "The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to operate a generator in the automatic voltage control mode as specified in Requirement 1," in M1 of VAR-002 to a more semantically neutral, "The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it did not operate a generator in the automatic voltage control mode." 2. PPL recommends the following changes to R2, for clarity; R2. Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule3 (within each unit's ratings or capabilities4) as directed by the Transmission Operator. [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations] 3. PPL suggests corresponding changes to R2.1. Note that the time frames are left blank in our recommendation, as there is still much discussion within the industry as to what an appropriate timeframe would be; If the system bus voltage drifts out of schedule, each Generator Operator shall notify its associated Transmission Operator within __ minutes when both of the following conditions are met: 1) the GOP has been operating outside of the prescribed voltage or Reactive Power schedule tolerance band5 for __ minutes; and 2) the GOP is no longer able to return to its voltage or Reactive Power schedule. Notification to the TOP is not required if the GOP can return to schedule. 4. In line with the recommended changes above, PPL suggests changing M2 to; Generator Operators shall operate the generators to help minimize excursions outside the established tolerance bands for the agreed-upon metering point. It is recognized that excursions may occur outside of the tolerance bands during unit start-up and shut-down, during MW and MVAR loading at a transmission bus where multiple units are connected, during time of relatively sudden transmission system loading changes, during system events and when grid conditions are beyond the capability of a generator to correct. Therefore, when the system bus voltage is out of the tolerance band, the Generator Operator will not be held in non-compliance with this requirement if the sub-requirements 2.1, 2.2, and 2.3 are met. In order to identify when a unit is deviating from its schedule, GOPs will monitor voltage at the agreed upon metering point to which the GOP has access. Therefore, GOPs have the option to operate on a voltage schedule on either the high-side or convert the high-side schedule to a low-side schedule at the GOP's discretion. For units that monitor on the low-side/terminal voltage, Generator Operators shall provide evidence of the method of conversion from the high-side schedule to low-side monitoring. GOP shall have evidence to show compliance with requirement R2 by providing 1) Communications with the TOP when the Generator Operator was operating outside of the prescribed voltage or Reactive Power schedule tolerance band for __ minutes AND Generator Operator was unable to return the generator to operation within its voltage or Reactive Power schedule tolerance bands; 2) Generator Operator implemented an alternative method to control reactive output when the AVR was out-of-service or unavailable; 3) compliance with directive to modify voltage or a notification that the directive could not be met. Evidence may include, but is not limited to Generator Operator logs, SCADA data, phone logs, and any other alarming notifications that would alert the Transmission Operator that both conditions were met. Timing for Requirement R2.1 can be crucial during system events, and Generator Operators are expected to begin timing when notified of an event by the TOP as soon as the unit is operating outside of the tolerance band. Further, voltage documentation during a system event may be requested by an auditor to show measures were taken to bring the unit back into schedule. 5. To harmonize Footnote 4 with our recommended language for R2, PPL suggests Footnote 4 be revised to state; For the operations horizon, the GOP may choose a test-based or real-time method of establishing a unit's reactive power capability. The test-based capability is that determined for compliance with MOD-025. Parameters typically monitored for determining real-time capability may include 1) generator loading (MW, MVAR, amps), temperatures, and terminal voltage; 2) GSU

loading and temperatures; 3) auxiliary bus voltages; 4) plant auxiliary equipment loadings, temperatures, and voltages; 5) Generator and GSU Volts/Hz limits; 6) excitation system and/or AVR limits. 6. If R2.1 sticks, PPL would like to see M2 clearly state that "if the GOP can return to schedule, it does not have to notify the TOP." 7. For the new footnote 6 referenced above; The TOP is to establish an official-for-compliance bus and phase voltage point for monitoring compliance of generators controlling to the high-side voltage. An excursion begins for compliance purposes when the measured voltage exceeds the bandwidth boundary by a recognizable amount (0.5%). Multiple notifications to the TOP need not be made when the system voltage wanders back and forth across the bandwidth boundary. The system voltage must be back within the boundary for one hour before the next excursion counts as a separate event. 8. VAR-002, R2.2 should read, "When a generator's automatic voltage regulator is out-of-service, the Generator Operator shall use an alternative method to control the generator reactive output to meet the voltage or Reactive Power schedule directed by the Transmission Operator, unless the TOP grants an exemption." The purpose of this change is to reference the process established in R3 of VAR-001. 9. VAR-002, R4.1 should be revised to state; "For generator step-up and auxiliary transformers with nominal primary voltages equal to the generator terminal voltage:" This is to clarify that R4 is N/A to startup transformers and other station auxiliary transformers connected to a HV bus at a plant. 10. VAR-002, R5 should read, "after consultation with the Transmission Operator and agreement on a schedule regarding necessary step-up transformer tap changes…'" for the reason stated under comment 3 above. Regarding the Technical Whitepaper; 1. The statement on p.7 that, "the more VARs produced at a generating facility, the fewer MWs produced," would be true only if operating to the generator OEM D-curve limit, and many generation units are instead typically limited by generator voltage limits due to variations in aux bus voltages. Under the latter situation raising and lower reactive power export or import does not affect the MW capability. 2. The statement on p.7 that "the informal development group did not want to place numerical requirements on what the proper operational limits should be for the continent," fails to consider that there are present-day abuses of the system that should be addressed in the VAR-001 update. Self-policing isn't working, hence our comment #1 above. 3. Ref. "unit drifts out of schedule," on p.9 it is the system that is drifting, not generation units. 4. The statement on p.10, "This industry divide is not addressed in the pro forma standard presented today," appears to account for some of the ambiguity discussed in the North American Generator Forum's comments. PPL believes that requirements need to be unambiguous, however, and there must also exist explicit and achievable means of achieving compliance. 5. While there is a sentence in the measure that states it is clearly the generator's discretion as to whether they monitor (presumably control) low side or high side to demonstrate compliance, we believe that there is still a substantial amount of language in the Standard and the Whitepaper that would tend to cloud that by implying that a generator should monitor high side for compliance if you have high side equipment installed; in other words, the monitoring/control point is based on current installed equipment. 6. Additionally, the Whitepaper does nothing to shed light on whether generators should make manual moves to reactive output (by changing the AVR low side set-point) without explicit direction form the TOP which leaves the compliance application open for interpretation.

Yes

1. In order 693 Page 488 the FERC "directive" for VAR-002 stated, "Dynegy has suggested an improvement to Reliability Standard VAR-002-1, and NERC should consider this in its Reliability Standards development process." Dynegy's concern stated, "VAR-002-1 should be modified to require more detailed and definitive requirements when defining the time frame associated with an 'incident' of noncompliance." Dynegy offered two alternatives to address their concern: "…[1] either more detail should be added to the Reliability Standard to cure this omission, Or [2] the Reliability Standard should require the transmission operator to have a technical basis for setting the time frame that takes into account system needs and any limitations of the generator." Their reasoning: "… this approach will eliminate the potential for undue discrimination and the imposition of overly conservative or excessively wide time frame requirements, both of which could be detrimental to grid reliability." Note that voltage tolerance band is not mentioned. 2. Going from NERC "should consider" Dynegy's suggested improvements to a very prescriptive time requirement (embedded in a VSL) in the current version of VAR-002 was a big step from the generation perspective. Also, it appears that Dynegy's second alternative was ignored during this step. 3. In the 2013 FERC Order approving VAR-002-2b (current version which became effective on July 1, 2013): PPL presented valid arguments against the "zero tolerance" time frame deviation introduced in the VSLs from the generator operator perspective (see Paragraphs 15 and 16). Both NERC and FERC rejected PPL's arguments. Paragraph

17 states, “NERC argues that the proposed modification would allow for a deviation in system voltage for up to 30 minutes to allow for time to correct an excursion and that such deviations from a voltage and reactive schedule is inappropriate because a deviation even up to a few minutes can negatively impact reliability.” Paragraph 18 goes on to say, “NERC maintains that significant voltage deviations for extended periods of time may lead to voltage collapse and can increase the potential for a wide-area impact to the reliability of the Bulk-Power System, and as such PPL Companies’ proposed modification to the VSL language should be rejected.” The context of the NERC and FERC discussions and agreement on the rigid time requirement apparently assumes all TOP’s voltage schedule tolerance bands are reasonable and “reliability based”. Also, there seems to be an absence of discussion on Dynegy’s 2nd alternative for the “the transmission operator to have a technical basis for setting the time frame that takes into account system needs and any limitations of the generator.” However, the Pro Forma VAR R1 will require each TOP to have documented policies or procedures used to “establish, monitor, and controls voltage levels and Reactive Power flows within limits as defined below: R1.1 These documented policies or procedures shall include criteria used in system assessments. The criteria for the assessments shall include established steady-state limits, voltage stability limits and associated operating margins, and voltage schedules along with associated tolerance bands.” Thus, a fair question on the Pro Forma standards follows: If VAR-001 R1.1 is met; can GOPs conclude that each TOP’s tolerance bands have a documented technical basis? If not, what mechanism will allow GOPs to question extremely narrow voltage or reactive power schedule tolerance bands that make compliance with VAR-002 R2.1 difficult or impossible? Note the Background discussions in the White Paper (see Pages 7 – 10). The discussion for VAR-001 R4 states, “The informal development group is cognizant of the fact that the nature of reactive power on the network varies depending on local conditions. Thus, the group focused on the process that the requirements would detail, not the proper numbers a TOP should enforce in the standard. For VAR-001, the group would not put operational limits on how a TOP should manage voltage stability for its regions; more specifically, the informal development group did not want to place numerical requirements on what the proper operational limits should be for the continent. Operating margins vary due to specific system characteristics as well as the operating conditions.” This begs the question: Why was this same rationale not applied in addressing the time frame? 4. The published reasons for the changes to VAR-002 include 1) eliminating nuisance calls and mitigating compliance issues for generators (i.e. non-reliability gap reducing violations), and 2) addressing the FERC directive to NERC to "consider a timeframe" for allowing a generator to be out of schedule before having to make a notification to its TOP. It could be argued that imposition of a very prescriptive time frame alone does not fully address the FERC “directive” language and the first Pro Forma objective of reducing nuisance calls (GOP to TOP), especially if the voltage tolerance bands are extremely tight or do not have a technical basis.
See responses to question 2 above.
Individual
Anthony Jablonski
ReliabilityFirst
Yes
ReliabilityFirst has a fundamental overarching concern with the two proposed standards and believe the two standards in their draft state have major flaws. The two drafts are completely dependent on each other and when implemented individually do not make sense and actually conflict with each other. This interdependency on each other may cause serious issues and potential issues within compliance space and overall reliability. For example, Requirement R5 in VAR-001-4 requires the Transmission Operator to know the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. If the Generator never supplies the status, there is a potential for a potential violation on the Transmission Operator. Another example includes Requirement R3 in VAR-001-4. If the Transmission Operator fails notify the Generator Operator that they are exempted, there is a potential for non-compliance for the Generator Operator not complying with R2 in VAR-002-3. ReliabilityFirst believes the linkage between the two standards is crucial and recommends combining the two standards to address the contradictory aspects of the two standards.
Yes

ReliabilityFirst provides the following comments related to the requirements and VSLs for the draft VAR-001-4 standard: 1. Requirement R1, Part 1.1 - ReliabilityFirst seeks further clarity on what is meant by the term “system assessments” in Requirement R1, Part 1.1. Are these “system assessments” meant to be performed in the near-term or long-term time period and what do encompass? 2. Requirement R1, Part 1.2 and Part 1.2 - There is no periodicity for when the documented policies need to be provided to the relevant entities. There is also no stipulation on whether changes to these polices need to be provided as well. ReliabilityFirst offers the following for consideration for Part 1.2: “Each Transmission Operator shall provide a copy of these documented policies or procedures to adjacent Transmission Operators [within 30 calendar days of request and within 30 calendar days of any changes]”. 3. Requirement R2 - ReliabilityFirst seeks further clarity on what is meant by the term “assessments” in Requirement R2. Are these “assessments” meant to be performed in the near-term or long-term time period and what do encompass? 4. Requirement R2, Part 2.1 and Part 2.2 - The Reliability Coordinator is an applicable entity for the parent Requirement R2 but is not listed within Part 2.1 or Part 2.2. ReliabilityFirst believes the Reliability Coordinator is relevant to both of the sub-parts and should be referenced in both sub-parts. For Part 2.1, the Reliability Coordinator can “…direct the real-time operation of devices…” and for Part 2.2, the Reliability Coordinator can help in ensuring “…that sufficient reactive resources have been scheduled…” ReliabilityFirst recommends referencing the Reliability Coordinator within Part 2.1 and Part 2.2. 5. Time Horizons Q2 - The Time Horizons within a number of the requirements (e.g., “Operations”) do not align with the five NERC defined Time Horizons (i.e., Long-term Planning, Operations Planning, Same-day Operations, Real-time Operations and Operations Assessment). ReliabilityFirst suggests the SDT review the NERC defined Time Horizons and modify the Time Horizons for all the requirements accordingly. The NERC defined Time Horizons are located at: http://www.nerc.com/pa/Stand/Resources/Documents/TimeHorizons.pdf. 6. VSL Requirement R1 - The High VSL should reference “sub-parts” rather than “sub-requirements.” NERC standards no longer include sub-requirements. 7. VSL Requirement R2 - The VSL is inconsistent with the language for Requirement R2. Based on the FERC VSL Guideline 3: “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement.” The VSLs are missing reference to the Reliability Coordinator which is an applicable entity for Requirement R2. ReliabilityFirst recommends adding the Reliability Coordinator to the VSLs associated with Requirement R2. 8. VSL Requirement R3 - ReliabilityFirst believes there should be an associated VSL referencing sub-part 3.1. ReliabilityFirst recommends the following for consideration: "High VSL – “The TOP failed to notify the associated Generator Operator, In the event a Transmission Operator approves a generator as satisfying the exemption criteria.” 9. VSL Requirement R4 - ReliabilityFirst believes the word “some” in the high VSL is ambiguous and troublesome and ambiguous. ReliabilityFirst recommends the following for consideration: i. High VSL – The Transmission Operator specified a voltage or Reactive Power schedule and tolerance band but failed to provide the voltage or Reactive Power schedule and tolerance band to the associated Generator Operator and direct the Generator Operator to comply with the schedule in automatic voltage control mode.” ii. Severe VSL – “The Transmission Operator failed to specify a voltage or Reactive Power schedule and tolerance band.” 10. VSL Requirement R5 - All Requirements are required to have a Severe VSL designation. Violation Severity Levels (VSLs) define the degree to which compliance with a requirement was not achieved. In cases where an entity completely failed to meet the intent of the requirement, it falls within the Severe category regardless of the risk to reliability (risk is dealt within the Violation Risk Factors). ReliabilityFirst recommends the following for consideration: i. Severe VSL – “The Transmission Operator failed to know the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. 11. VSL Requirement R6 - All Requirements are required to have Severe VSL designation. Violation Severity Levels (VSLs) define the degree to which compliance with a requirement was not achieved. In cases where an entity completely failed to meet the intent of the requirement, it falls within the Severe category regardless of the risk to reliability (risk is dealt within the Violation Risk Factors). ReliabilityFirst recommends the following for consideration: i. High VSL – “The Transmission Operator failed to provide documentation to the Generator Owner specifying either the required tap changes, a timeframe for making the changes, or technical justification for these changes.” ii. Severe VSL – “The Transmission Operator failed to provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes, and technical justification for these changes.” ReliabilityFirst provides the following comments related to the requirements and VSLs for the draft VAR-002-3 standard: 1. Requirement R2, Part 2.2 - For consistency, spell out Generator Operator rather than listing the acronym “GOP.” 2. Requirement R5 -

The parent Requirement R5 is applicable to the Generator Owner while the sub-part 5.1 specifies the Generator Owner. The same applicable entity listed in the “parent” requirement should be the same as any associated sub-parts. This inconsistency needs to be remedied. 3. VSL Requirement R2 - The VSL is inconsistent with the language for Requirement R2. Based on the FERC VSL Guideline 3: “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement.” ReliabilityFirst recommends the following for consideration: i. Severe VSL – “The Responsible entity failed to maintain the generator voltage or Reactive Power schedule as directed by the Transmission Operator in accordance with Requirement R2, parts 2.1, 2.2 and 2.3 “ 4. VSL Requirement R3 - The VSL is inconsistent with the language for Requirement R3. Based on the FERC VSL Guideline 3: “Violation Severity Level Assignment Should Be Consistent with the Corresponding Requirement.” ReliabilityFirst recommends the following for consideration: i. Severe VSL – “The Responsible entity failed to notify its associated Transmission Operator of a status or capability change on any generator Reactive Power resource within 30 minutes of the change.” 5. VSL Requirement R4 - The VSLs for Requirement R4 are completely inconsistent with the associated Requirement R4. Requirement R4 speaks to the Generator Owner providing data to the Transmission Operator while the VSL speaks to the failure of maintaining the generator voltage or reactive power schedule. ReliabilityFirst recommends reviewing Requirement R4 and developing VSLs consistent with the requirement. 6. VSL Requirement R5 - Requirement R5 is applicable to the Generator Owner while the associated VSL refers to the Generator Operator. This inconsistency needs to be remedied.
Individual
Scott Helyer
Tenaska, Inc.
No
Yes
We appreciate the language giving GOPs the option to monitor voltage on the low-side of the step-up transformers. This is a positive step, but work is still needed on the proposed standards. One concern is that VAR-001-4 allows the TOP to set voltage/reactive power schedules with tolerance bands. However, setting a tolerance band that is too narrow will require GOPs to frequently call TOPs as required in VAR-002-3 anytime the system causes the generator to move outside the tolerance band. The drafting team should consider whether a minimum tolerance band should be included in the standard that is enough to maintain a reliability voltage, but is large enough to minimize the potential for constant communications between GOPs and TOPs. Another concern is that VAR-002-3 R2 should specifically state that a GOP shall be allowed to convert a high-side schedule and control voltage on the low-side of the step-up transformer. Otherwise, R2 and M2 do not match as M2 is the only place where this language is provided. Further, VAR-002-3 requires the GOP to inform the TOP if the voltage drifts outside the tolerance bands set by the TOP. The problem is that GOPs may frequently find themselves outside the tolerance bands as the system voltage drifts if the TOP does not set appropriate tolerance bands.
No
Group
SERC EC Generation Subcommittee
David Thompson
Yes
There is a general concern with this proposed standard that it will create further administrative burden for the GOP, TOP, and RC, as well as the back office staff. Additionally, the high probability exists that the number of calls between the GOP and TOP will increase without materially enhancing BES reliability.

Yes
VAR-002-3 Comments: 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) unless Delete: "the Generator Operator has notified the Transmission Operator of one of the following:" a generator has been has been exempted from operating in the AVR voltage control mode by the Transmission Operator or the Generator Operator has notified the Transmission Operator of one of the following: M1. Add words “Unless exempted” the Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it Add words: “did not” operate a generator in the automatic voltage control mode. R2. Add "Unless exempted" by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule (within Replace: “applicable Facility Ratings” with Add words: “each unit’s ratings or capabilities4”) (NOTE: Footnote 4 should be associated with R2.2, not R2.1.) as directed by the Transmission Operator. [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations] 2.1. When directed to modify voltage, the Generator Operator shall comply or provide an explanation of why the schedule cannot be met. [Delete Pro Forma 2.1 and replace it with Pro Forma 2.3. See our comments below and in our response to Question 3.] 2.2. When a generator’s automatic voltage regulator is out-of-service, the Generator Operator shall use an alternative method to control the generator reactive output to meet the voltage or Reactive Power schedule directed by the Transmission Operator Add words: “unless the TOP grants an exemption.” Comments: We feel that approach and language in VAR-002-2.b R2.2 should be retained. This approach reflects closer alignment with VAR-001-4 and current language in the Functional Model for Generator Operator expectations and current plant design features. The GS recommends NERC vet the White Paper for this standard through formal industry review, get stakeholder input and consensus as required per the Standards Process Manual, section 11. It appears that this standard has been written with the assumption that generators can monitor and directly control transmission bus voltage (only some monitor it and almost none directly control it). With the elimination of (the 18 Jul 2013 proposed) R2.1 this measure (M2) should be rewritten. The revised M2 should not include additional requirements. Comments: The M2 information should be considered during the revision of the White Paper. R3. Each Generator Operator shall notify its associated Transmission Operator of a status or capability change on any generator Reactive Power resource, including the status of each automatic voltage regulator and power system stabilizer and the expected duration of the change in status or capability within 30 minutes of the change. If the status has been restored within the first 15 minutes of such change, then there is no need to call the TOP. [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations] Comments: The GS suggests clarifying the term “capability change” in the White Paper revision. There is considerable confusion about the time requirement and it is not clear that these are applicable to the AVR status question or the capability change question. It may make sense to separate these two requirements to allow better clarification. M3. The Generator Operator shall have evidence it notified its associated Transmission Operator Replace: “within 30 minutes of any of the changes identified” with Add words: “as required” in Requirement 3. If the status has been restored within the first 15 minutes, no call is necessary. R4. The Generator Owner shall provide the following to its associated Transmission Operator and Transmission Planner within 30 calendar days of a request. [Violation Risk Factor: Lower] [Time Horizon: Real-time Operations] 4.1. For generator step-up transformers and auxiliary transformers with Add words: “nominal” primary voltages equal to (Delete words “or greater than” the generator terminal voltage: Comments: (This is to clarify that R4 is N/A to startup transformers and other station auxiliary transformers connected to a HV bus at a plant.) R5. After consultation with the Transmission Operator Add words: “and agreement on schedule” regarding necessary step-up transformer tap changes, the Generator Owner shall ensure that transformer tap positions are changed according to the specifications provided by the Transmission Operator, unless such action would violate safety, an equipment rating, a regulatory requirement, or a statutory requirement. [Violation Risk Factor: Lower] [Time Horizon: Real-time Operations]. Regarding the Technical Whitepaper; 1. The statement on p.7 that, “the more VARs produced at a generating facility, the fewer MWs produced,” would be true only if operating to the generator OEM D-curve limit, and many generation units are instead typically limited by generator voltage limits due to variations in aux bus voltages. Under the latter situation raising and lower reactive power export or import does not affect the MW capability. The NATF Model Practices Group has recognized that improvements in the way units are modeled for reactive power capability that respects other plant operating limitations, such as aux system voltage limits need to be investigated and have a project to review this issue. 2. The

statement on p.7 that “the informal development group did not want to place numerical requirements on what the proper operational limits should be for the continent,” fails to consider that there are present-day abuses of the system that should be addressed in the VAR-001 update. Numerical tolerance bands should be based on clear system reliability criteria and not some arbitrary tolerance band. For example, maximum voltage limits should be based on equipment ratings at that point in the system. 3. Ref. “unit drifts out of schedule,” on p.9 it is the system that is drifting, not generation units. 4. The statement on p.10, “This industry divide is not addressed in the pro forma standard presented today,”. The SDT is encouraged to follow through on AVR paragraph under the VAR-002 section by pursuing full industry review of the White Paper as required by the Standards Process Manual, section 11. 5. While there is a sentence in the measure that states it is clearly the generator’s discretion as to whether they monitor (presumably control) low side or high side to demonstrate compliance, we believe that there is still a substantial amount of language in the Standard and the Whitepaper that would tend to cloud that by implying that a generator should monitor high side for compliance if you have high side equipment installed; in other words, the monitoring/control point is based on current installed equipment. 6. Additionally, the Whitepaper does nothing to shed light on whether generators should make manual moves to reactive output (by changing the AVR low side set-point) without explicit direction from the TOP which leaves the compliance application open for interpretation.
Yes
Comments: See question 2 comments above. VAR-001-3 allows the TOP to determine the appropriate voltage schedules and tolerances for that TOP’s area for the reasons stated in the White Paper under the VAR-001 section. Why does VAR-002 not allow the TOP to determine the corresponding time requirement? We believe that the prescriptive time requirement in VAR-002 may cause conflicts with R4 of VAR-001 such that system requirements and different control areas may require different notification and therefore will be problematic for system and plant operators. The TOPs are familiar with their systems and will issue voltage tolerance bands based on their system needs. Therefore, it is appropriate for the TOPs to establish the associated time frame for their tolerance bands based on their system needs. That is, the time frame should be linked to the tolerance band. If the voltage tolerance is reliability based the TOP with the RC should be able to establish a corresponding time tolerance for deviations from the scheduled voltage. No reliability gaps should exist if both voltage tolerance band and corresponding time frame are reliability based rather than arbitrarily established. It is imperative that the TOPs provide realistic voltage tolerances and time frames that are 1) practical for both system operators and generator operators who have many duties related to system and plant reliability and safety, and 2) will not result in administrative burdens due to unnecessary notification and possible violations for deviations in voltage schedule that do not pose a BES reliability concern. Further, it appears that this standard has been written with the assumption that generators can monitor and directly control transmission bus voltage. Generation design standards have been that plant voltage regulators regulate the generator bus and having operators being able to see grid voltage has not been a standard. The responsibility for monitoring transmission class voltage has been a transmission operations function and taking action to makes changes requires a wider system view that the generation plants will ever have. This is what is reflected in version 5 of the Functional Model, which states that the GOPs in Real Time 10. Provides Real-time operating information to the Transmission Operators and the required Balancing Authority. 11. Adjusts real and reactive power as directed by the Balancing Authority and Transmission Operators.
The SDT is encouraged to follow through on AVR paragraph under VAR-002 by pursuing full industry review of the White Paper as required by the Standards Process Manual, section 11. The comments expressed herein represent a consensus of the views of the above named members of the SERC Generation Subcommittee (GS)only and should not be construed as the position of the SERC Reliability Corporation, or its board or its officers.
Group
Florida Municipal Power Agency
Frank Gaffney
No
Yes

FMPA appreciates the efforts of the ad hoc team; but, the ad hoc team missed many opportunities to reduce duplication of the VAR standards with other standards (e.g., TOP standards, FAC-011, FAC-014). Consequently, FMPA is recommending a Negative vote. VAR-001-4, R1 is Duplicative of FAC-011 and the TOP-004 Standards This requirement as drafted is duplicative of existing TOP-004-2: "R6. Transmission Operators, individually and jointly with other Transmission Operators, shall develop, maintain, and implement formal policies and procedures to provide for transmission reliability. These policies and procedures shall address the execution and coordination of activities that impact inter- and intra-Regional reliability, including: R6.1. Monitoring and controlling voltage levels and real and reactive power flows. R6.2. Switching transmission elements. R6.3. Planned outages of transmission elements. R6.4. Responding to IROL and SOL violations." The Project 2007-03 SDT that revised the TOP standards found this requirement administrative in nature and eliminated the need for policies and procedures, mapping much of this requirement to the Purpose statement of the new TOP-001-2 Standard. VAR-001-4 should at least remain consistent with Project 2007-03 SDT's intent and eliminate policies and procedures as administrative in nature. R1 as drafted is also duplicative of FAC-011, System Operating Limit Methodology in the Operating Horizon: Proposed VAR-001-4, R1, 1.1: "These documented policies or procedures shall include criteria used in system assessments. The criteria for the assessments shall include established steady-state limits, voltage stability limits and associated operating margins, and voltage schedules along with associated tolerance bands." (emphases added) Existing FAC-011-2: "R2. The Reliability Coordinator's SOL Methodology shall include a requirement that SOLs provide BES performance consistent with the following: R2.1. In the pre-contingency state, the BES shall demonstrate transient, dynamic and voltage stability; all Facilities shall be within their Facility Ratings and within their thermal, voltage and stability limits … R3. The Reliability Coordinator's methodology for determining SOLs, shall include, as a minimum, a description of the following, along with any reliability margins …" (emphases added) Hence, R1 as drafted essentially requires developing and implementing policies and procedures to: a) Operate within SOLs. b) Operate to voltage schedules The only unique part of R1 that is different than FAC-011 is "voltage schedules along with associated tolerance bands". Therefore, R1 should be boiled down to just the TOP or RC establishing, and the TOP operating to "voltage schedules along with associated tolerances bands" to eliminate duplication with other standards. In addition, FMPA questions whether the RC should establish these voltage schedules instead of the TOP. If neighboring TOPs establish different, uncoordinated voltage schedules, then at the boundaries between TOPs, voltage schedules may be difficult to maintain and there will be significant VAR flow between the TOPs with significant associated losses. Coordinated voltage schedules between TOPS should be required. This can be accomplished in two ways: 1) the RC develops the voltages schedules; or 2) the word "jointly" is reintroduced to R1 (the ad hoc team chose to eliminate the word "jointly" from the existing requirement) so that neighboring TOPs "jointly" develop a coordinated voltage schedule. VAR-001-4, R2 is Duplicative of TOP-002 and TOP-001 and should be Eliminated VAR-001-4, R2 requires the TOP to perform assessments (which is duplicative of TOP-002-3, R2 to develop a plan to operate) to ensure sufficient reactive reserves to maintain voltage stability. Voltage stability is a determinant of SOLs; hence, the standards already require TOPs to develop and to operate within SOLs, including SOLs determined by voltage stability limits (FAC-011, FAC-014, TOP-001-2 R7 through R11, TOP-004-2, TOP-007-0). VAR-001-4 also requires TOPs to direct action if needed; for which they already have responsibility under TOP-001. Hence, R2 as drafted is entirely duplicative of other requirements and should be eliminated. VAR-001-4, R5 is Duplicative of TOP Standards and should be Eliminated TOP-006-2 states: "R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use .... R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources." So, contrary to the ad hoc team's assertion, R5, which requires the TOP to know the status of all reactive power resources, AVRs and PSSs on their system, is duplicative of TOP-006-2, R1 and R2 which do include Power System Stabilizers and voltage regulators (e.g., "status of rotating … reactive resources"). The Project 2007-03 SDT mapped this to the TOP-003-2 standard, R1, which states: "Each Transmission Operator shall create a documented specification for the data necessary for it to perform its Operational Planning Analyses and Real-time monitoring." Hence, if the ad hoc team disagrees with the action of the Project 2007-03 SDT in generalizing the requirement to a generalized data request as opposed to the specificity of exactly what "data (is) necessary for it to perform its … Real-time monitoring" the ad hoc team seems to desire, then, the newly formed SDT for this VAR project should instead modify TOP-

003-2 to incorporate that specificity and not include this requirement in VAR-001-4. VAR-002-3, R2, 2.3 is Duplicative of TOP-001 and should be Eliminated The requirement is essentially for GOPs to follow a directive of the TOP; which is duplicative of TOP-001-2, R1 which states: “Each Balancing Authority, Generator Operator, Distribution Provider, and Load-Serving Entity shall comply with each Reliability Directive issued and identified as such by its Transmission Operator(s), unless such action would violate safety, equipment, regulatory, or statutory requirements.” Hence, VAR-002-3, R2, 2.3 should be eliminated. If “directed” as used in the draft VAR-002-3, 2.3 is not intended to be from a Reliability Directive, then, clarification is required as to what “directed” means. VAR-002-3, R3 is Duplicative of TOP-003 and should be Eliminated VAR-002-3, R3 as drafted requires GOPs to inform the TOP of changes in status or capability from a reactive power perspective. This is very similar in nature to the GOPs’ obligation to inform the TOP of the same from a real power perspective in TOP-002-2, R14. The Project 2007-03 SDT mapped this to TOP-003-2, R5 which states: “Each Transmission Operator, Balancing Authority, Generator Owner, Generator Operator, Interchange Authority, Load-Serving Entity, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall satisfy the obligations of the documented specifications for data.” It is expected that the TOP will require such data in TOP-003-2, R1, and the GOPs will need to respond in accordance with TOP-003-2, R5. If the ad hoc team disagrees with the action of the Project 2007-03 SDT in generalizing the requirement as opposed to the specificity of exactly what “data (is) necessary for it to perform its … Real-time monitoring” the ad hoc team seems to desire, then, the newly formed SDT for this VAR project should instead modify TOP-003-2 to incorporate that specificity and not include this requirement in VAR-002-3.
Individual
Kathleen Goodman
ISO New England, Inc.
Agree
IRC SRC
Individual
Nazra Gladu
Manitoba Hydro
No
Yes
(1) Manitoba Hydro believes that Power System Stabilizer (PSS) should not be included in the standard (R3) because they are not designed for, nor could they be operated in any way to maintain and/or control Network voltage (schedules). In particular: (a) PSS deals with power swings (oscillations) by adjusting the generator voltages through AVRs to add damping to the generator rotor oscillations. The outcome of this process is to provide more stable real power transfer. (b) PSS does NOT control the generator or network voltages, but instead affects them in a uncontrollable way. Moreover, PSS does not contribute to the voltage stability. (c) If PSS must be included in the scope of this standard, then Manitoba Hydro believes that other functions in the AVR such as overexcitation limit (OEL), under excitation limit (UEL) and voltage per hertz limit should be included as well since they all at some point will affect the generator voltages during periods of “normal” operation. (d) It is our experience that PSSs are sometimes out of service as a result of automatically shutting off based on design and operational criteria which may include below certain gate positions or loading levels. In modern designs, the PSSs are normally part of the excitation control system and there is no physical turn-on/off switch (even though our utility has always asked for switches for easy operation). Manitoba hydro believes that there is a lack of clarity in the standard as it pertaines to the need to/process of reporting this status, i.e. the function of PSS is automatically switched off/on (out-of or back-in-service) during normal operation. Manitoba Hydro believes that if a requirement of the PSS is to remain in the standard, then a formal interpretation on this situation is warented. (2) Please clarify that when Automatic Voltage Regulators (AVR’s) or Power System Stabilizers (PSS) come out of service, the appropriate Reliability Coordinator, Transmission Operator and neighbors are to be

notified should they be impacted. Moreover, this must be documented and posted for other Transmission Operators and RC's to view.
No
(1) Effective Dates, VAR-001-4 and VAR-002-3 - replace the words " Board of Trustees approval " with " Board of Trustees' approval " for consistency with other standards. (2) General Comment - replace " Board of Trustees " with " Board of Trustees' " throughout the applicable documents/standards for consistency with other standards.
Individual
Karen Webb
City of Tallahassee - Electric Utility
No
Yes
The standards already require coordination. If the TOP is not being provided enough "cooperation" from the GOPs in their footprint, then there is a need for stronger internal documents to achieve the necessary level of cooperation. While the standard states they must coordinate, it does not provide to what extent. One solution may be to compensate VAR output as well as MW output for the GOPs. As it pertains to VAR-002-3, the last sentence of R3, should state "…..no need to NOTIFY the TOP", in lieu of "call the TOP." This consistency would be appreciated.
No
The standards already require coordination. If the TOP is not being provided enough "cooperation" from the GOPs in their footprint, then there is a need for stronger internal documents to achieve the necessary level of cooperation. While the standard states they must coordinate, it does not provide to what extent. One solution may be to compensate VAR output as well as MW output for the GOPs.
Individual
Scott Langston
City of Tallahassee
No
No
No
The standards already require coordination. If the TOP is not being provided enough, "cooperation" from the GOPs in their footprint, then there is a need for stronger internal documents to achieve the necessary level of cooperation. While the standard states they must coordinate, it does not provide to what extent. One solution may be to compensate VAR output as well as MW output for the GOPs. As it pertains to VAR-002-3, the last sentence of R3, should state "…..no need to NOTIFY the TOP", in lieu of "call the TOP." This consistency would be appreciated.
Individual
Bill Fowler
City of Tallahassee
No
No

No
The standards already require coordination. If the TOP is not being provided enough, “cooperation” from the GOPs in their footprint, then there is a need for stronger internal documents to achieve the necessary level of cooperation. While the standard states they must coordinate, it does not provide to what extent. One solution may be to compensate VAR output as well as MW output for the GOPs. As it pertains to VAR-002-3, the last sentence of R3, should state “…..no need to NOTIFY the TOP”, in lieu of “call the TOP.” This consistency would be appreciated.
Group
Duke Energy
Michael Lowman
No
Yes
Duke Energy suggests the SDT consider using the NERC defined terms of Operating Plan, Operating Process or Operating Procedure instead of “policies or procedures” in Requirement 1 to provide clarity and consistency. R1.2 and R1.3 should be revised and consolidated to read, “ Upon request, the TOP shall provide a copy of these documented Operating Plans, Operating Processes, or Operating Procedures to adjacent Transmission Operators and its Reliability Coordinator. “ Duke Energy recommends the SDT determine the correct NERC defined Time Horizon necessary for all requirements in VAR-001-4 as “Operations” is not considered a valid NERC defined time horizon. Measure 1 would have to be modified if “Upon request” is accepted by the SDT. Duke Energy suggests the following for Requirement 2 1. R2 should be changed to, “Each Transmission Operator and Reliability Coordinator shall perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1. 2. R2.2 should be changed to, “As a result of the assessments, each Transmission Operator shall ensure that sufficient reactive resources have been scheduled are available to meet acceptable day-ahead voltage limits identified in Requirement R1. Sufficient reactive resources may include, but is not limited to reactive generation scheduling; transmission line and reactive resource switching; and controllable load. Duke Energy seeks clarification on the term “real-time event” used in M2. What was the criterion considered to constitute a “real-time event”? The concern is that an auditor could consider a 1kV voltage deviation a “real-time event”. This type of voltage deviation has no impact to the reliability of the BES. The SDT should consider using alternative language that is more specific. Duke Energy suggests alternative language for VAR-001-04 R4.1 and VAR-002-3 R.1. Per the NERC Compliance Analysis Report of the VAR-002, it is stated that there are three widely-used AVR modes for generators: AVR- automatic controlling voltage mode, AVR-VAR mode, and AVR-power factor mode. Duke Energy is aware of a number of generating facilities that are not equipped with an automatic voltage regulator, thus the pro-forma standard should be revised to include other known AVR modes. Duke Energy suggests the following language: VAR-001-4 R4.1 should read: 4.1. The Transmission Operator shall provide the voltage or Reactive Power schedule and tolerance band to the associated Generator Operator and direct the Generator Operator to comply with the schedule in one of three AVR modes (AVR-automatic controlling voltage mode, AVR-power factor control mode, or AVR-VAR control mode) as determined to be appropriate by the TOP. R1. The Generator Operator shall operate each generator connected to the interconnected transmission system in one of three AVR control modes specified by the Transmission Operator (AVR-automatic controlling voltage mode, AVR-power factor control mode, or AVR-VAR control mode)unless 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-up1 or shutdown2 • That the generator is not being operated in the TOP-directed AVR control mode for a reason other than start-up or shutdown. In VAR-002-3 R4, Duke Energy suggests removing auxiliary transformers from the standard. Auxiliary transformers are not used to control MVars for reliability purposes. In VAR-002-3 R5, Duke Energy suggests inserting the phrase “mutual assent” into the language of R5. The standard language should read as follows: R5. “After consultation and mutual assent with the Transmission Operator regarding necessary step-up transformer tap changes, …”

Yes
Duke Energy suggests extending the timeframe a GOP must notify its TOP of schedule drift to 30 minutes to allow time for recognition of the problem, assessing corrective action needed, and contacting the TOP when required. Regarding VAR-002-3 R2.1, the start time that a generator “drifts out of schedule” (i.e. is considered to have drifted out of schedule), is dependent upon the method used for monitoring the voltage. Does the clock start based upon the first scan that the generator is outside the voltage schedule, and stop upon the first scan that the generator is back within the voltage schedule? If not, how long of a period must a generator be back within schedule to reset the clock? Can the Transmission Operator define the criteria for measurement when the voltage schedules are provided? For example, can the TOP indicate that a generator is considered outside its voltage schedule when the clock-minute average voltage is outside the schedule? No matter of the data used for measuring voltage against the voltage schedule (scan-rate, clock-minute, rolling ten-minute average), is a generator considered back within its voltage schedule (clock stops) based on the same measurement to contact the TOP? Duke Energy suggests clarifying the term “capability change” in the White Paper revision. There is considerable confusion about the time requirement and it is not clear that these are applicable to the AVR status question or the capability change question. It may make sense to separate these two requirements to allow better clarification. Duke Energy suggest adding the words “or maintain any documentation” after TOP in the R3 sentence. The rewording should read as follows: “If the status has been restored within the first 15 minutes of such change, then there is no need to call the TOP or maintain any documentation” Duke Energy suggests rewording Measure 3 as follows: “The Generator Operator shall have evidence it notified its associated Transmission Operator as required in Requirement 3. If the status has been restored within the first 15 minutes, no call is necessary.”
Individual
John Bee
Exelon and its' affiliates
Yes
As NERC representatives pointed out in recent webinars, one goal of many of the existing standard development projects is to seek a steady state for applicable standards. In order to avoid iterative development projects, the SARs should accommodate all known issues and/or recommendations. The recently issued Independent Experts Review Project cites some requirements within VAR-001 and VAR-002 for attention. The scope of the SAR should include assessment and resolution of the Independent Expert Review Report recommendations. Additionally, to the extent related, the recently submitted risk assessment by the RISC should be considered when developing the scope of SARs. Question 4 below requests input on specific issues acknowledged are not currently included in this project. More detail is below, but Exelon supports addressing all known issues, not just the FERC directives, at this time. In addition, Exelon supports the concept of developing Compliance Guidance concurrently with the Standard development because it makes sense to develop audit explanations and tools while the intent and information is fresh and under development. In addition, this is very useful for Registered Entities to understand how compliance will be judged. However, it is not clear how development of Compliance Input is to be conducted. The Compliance Input should evolve as the Standard language evolves through the standards development process and must ultimately reflect the actual language in the final, approved standard. Understanding that no ballot is associated with Compliance Input, it would be very useful for NERC to post Compliance Input with a separate comment form for stakeholder input. Some of the project SARs cite development of an RSAW. Stakeholder Review and comment on RSAWs and Compliance Input prior to the final ballot of a proposed standard will be mutually beneficial.
Yes
The VAR white paper discusses VAR-002 Requirement R2 and provides a discussion on notifications regarding adherence to a voltage schedule. Specifically, this paper mentions instances where the unit may not be able to return to schedule when it has encountered an operating limit, or when a system event is pulling the unit out of schedule; however, this project does not address issues where the TOP (as may be delegated to the TO) provides an unrealistic voltage schedule that is difficult if at all possible to maintain by the Generator Operator. The white paper evaluates the need for the TOP and

GOP to agree to a voltage schedule but dismisses that concept as it could create “disputes between the parties as to what the appropriate voltage schedule should be for a unit”. In our opinion, VAR-002 should provide a vehicle for a GOP to challenge what they may perceive as an unrealistic schedule if that schedule is unmanageable or challenges the physical operating capability of the generating unit. Exelon suggests that a formal notification to the TOP/TO with a technical justification be required to ensure that this challenge not be abused by the GOP. We believe it is reasonable to allow the generator to monitor the high side or the low side of the generator step up transformer; however, the TOP should align their voltage schedule to match the GOP chosen monitoring equipment or agree on the conversion factor. There is not a one for one conversion between grid voltage and terminal voltage and both parties should agree on the conversion to avoid any future audit or implementation issues. Further to the the specific language in proposed VAR-002, R2, the statements do not seem to track with the stated intent. It appears that a GOP is to notify a TOP within 15 minutes concurrently with being out of the schedule for 15 minutes. Should the language read: “…each Generator Operator shall notify its associated Transmission Operator within 30 minutes when both of the following conditions are met: …” VAR-002, R2.3. When directed to modify voltage, the Generator Operator shall comply or provide an explanation of why the schedule cannot be met. Suggest that “the schedule” be replaced with “the modified Voltage Level” since a request to move Voltage is not really a new “schedule” it is just a temporary change. The Implementation Plan for VAR-001-4 and VAR-002-3 requires the new Standard revisions to be implemented the first day of the first calendar quarter after applicable regulatory approval. This is not sufficient time to allow generating units to implement training of operators and procedural changes necessary to implement the proposed changes to notification requirements. Suggest at least a 6 month implementation period following regulatory approval. Note that as written in the proposed implementation plan, the “first calendar quarter following approval” does not guarantee even the cited timeframe of 3 months (i.e. if approved in March 2014, it becomes effective April 1, 2014). To accommodate a six month implementation period the language must mark time in months. For example the language should read: “this standard shall become effective on the first day of the seventh month after applicable regulatory approval…” The current draft does not have any tolerance at all and starts a time requirement regardless of the deviation from the voltage band. Why is this Standard requiring a time requirement for notification to the TOP when each voltage schedule, tolerance, and voltage band is different for each generator based on size, location, impact to the system and the TOPs preference for operating its system?. The voltage schedule, tolerance band, and notification requirements should be left to the discretion of the TOP. The revised Standard VSL should include a percentage value associated with an excursion outside of the voltage schedule. If the Standard moves forward without any evaluation of the magnitude of deviation from the voltage schedule, then there should be some consideration of this in the associated VSLs. Finally Exelon suggests that the Compliance Section 1.2 Evidence Retention for VAR-002-3 should read the same as for VAR-001-4.

Yes

If the operator takes the time to trouble shoot, make repairs or makes attempts to get the AVR or If the operator takes the time to trouble shoot, make repairs or makes attempts to get the AVR or PSS back to automatic, the operator limits the time available to notify the TOP that the AVR or PSS is not in auto. Exelon recommends that the time for notification be increased to allow for the operator to trouble shoot and make a determination that the AVR/PSS cannot be put back in auto. Additionally, Exelon would like the standard to specify that AVR/PSS status indication, if installed, via SCADA will satify the notification requirement.

As stated above, this project does not address issues where the TOP (as may be delegated to the TO) provides an unrealistic voltage schedule that is difficult if at all possible to maintain by the Generator Operator. Throughout the white paper and this comment form there is the common theme of addressing a “reliability gap”. In the cases of generator who are given an almost impossible job of attempting to adhere to an unrealistic voltage schedule, there is frustration on the operator’s part or constant attempts to adjust voltage that has little or any impact on the system. In the technical white paper this is classified as a “minority issue” however in our opinion this is an issue that definitely warrants attention therefore Exelon feels that it is appropriate to expand the scope of this project to address this and all known issues relevant to the Standards.

Individual

dmason

HHWP

No
Yes
"The Transmission Operator shall know the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. [Violation Risk Factor: Medium] [Time Horizon: Operations]" does not allow for a TOP to specify its own information requirements for ensuring that its portion of the BES is operated reliably.
No
Yes it is appropriate to address the coordination between GOP and TOP in this project
Group
ACES Standards Collaborators
Jason Marshall
Yes
(1) We are concerned that the informal development process that was originally contemplated has gone off course. The original plan that was announced to industry was to have an informal development team create a proposal for a standard, which would then pass the preliminary work to a formal standard drafting team to continue the development process. This is not what has occurred. The informal development process should not circumvent the NERC Rules of Procedure. (2) We question the value in posting the draft standard with the SAR. What good is the SAR posting if a standard has already been developed? This gives the impression that the Standards Committee has already determined the need for the standard and eliminated the opportunity for industry stakeholders to provide feedback. It seems unnecessary to comment on the SAR at this point because it appears that it was drafted in tandem with the pro forma standard. We urge NERC to pay close attention to its Rules of Procedure and the Standard Process Manual to avoid deviations and setting precedent that could be challenged in the future. (3) We are also concerned that the standards process manual was not followed correctly regarding the selection of the drafting team. The nomination period began after the draft standard was posted, which clearly shows the ad hoc team developed the draft standard instead of satisfying the activities it was charged with by vetting the issues of the VAR standards with industry. The initial draft standard should be the work of the appointed standards drafting team. We doubt that there was sufficient time for the new drafting team members to thoroughly review and agree with the language in the initial posting. The method of developing the initial draft should comply with the NERC Rules of Procedure and we are concerned that a bad precedent is being set.
Yes
(1) Requirement VAR-001-4 R1 is redundant with FAC-011-2 and FAC-014-2 and, thus, meets paragraph 81 criteria. FAC-014-2 R2 requires each TOP to establish SOLs for its transmission system that is consistent with the RC SOL methodology. FAC-011-2 R2 compels the RC to develop a SOL methodology that requires SOLs to consider voltage, thermal, and stability limits (including voltage) and demonstrate that the BES remains stable (transient, dynamic and voltage) during pre-contingent (R2.1) and post-contingent (R2.2) conditions. FAC-014-2 R6 compels the Planning Coordinator to identify which Category C (multiple) contingencies from TPL-003 that result in stability limits (including voltage) and to communicate the list of Category C (multiple) contingencies along with the stability limits to the RC. FAC-011-2 further compels the RC to establish a process for identifying which stability limits associated with multiple contingencies identified by the Planning Coordinator are applicable in the operating horizon within its SOL methodology. FAC-014-2 R5.2 compels the TOP to communicate its SOLs to its RC and TSP and FAC-014-2 R5.1 compels the RC to communicate the SOLs to neighboring RCs and other TOPs among a list of other entities. Finally, existing TOP-002-2.1b R10 and proposed TOP-002-3 R2 require the TOP to operate within SOLs. Thus, the combination of FAC-011-2 and FAC-014-2 compel the establishment and communication of SOLs within the TOP footprint that already consider the items such as steady-state voltage limits and voltage stability limits compelled in proposed VAR-001-4 R1 and its subparts and TOP-002 compels the TOP to operate within those SOLs. Please strike R1 in its entirety since it is clearly redundant. If the drafting team

does not strike the requirement, we ask that technical justification be provided to explain why the requirement should remain and why the redundancy is necessary. (2) If the standards development team determines there is a technical distinction that would justify why requirement VAR-001-4 R1 remains in the standard, we suggest combining parts 1.2 and 1.3 for simplicity since they both are about providing documentation. (3) We are concerned with the statement in the rationale box for R1 that this "requirement will allow each Transmission Operator (TOP) to establish its own policies and procedures". This statement implies that the TOP cannot create its own voltage policies and procedures without this requirement. This is simply not the case. All TOPs already have their own policies and procedures for voltage so the requirement is not necessary to "allow". Since there is not a specific requirement to have such policies and procedures, some may not be documented to the level necessary to demonstrate compliance but they do exist. Please modify the rationale box to state that it will "compel" or "require" and not "allow" policies and procedures. (4) While we believe VAR-001-4 R1 is redundant with other standards as stated above, we recommend removing "establish" and "Reactive Power flow (Mvar flows)" in R1 if the requirement persists. Both are redundant and, thus, superfluous. First, you cannot monitor "voltage levels… within limits" without establishing such limits. Furthermore, the requirement to establish limits is clear in Part 1.1. Second, you cannot control voltage levels with controlling Reactive Power flows. Thus, it is redundant in the requirement. (5) If VAR-001-4 R persists, please change "Mvar" to "MVAr" in requirement R1. It is actually the correct way to document megavolt amperes reactive. (6) VAR-001-4 M1: The measure contradicts itself. It states web postings as valid evidence but then states that posting a copy of the policy or procedure on a public website is not sufficient. Is it valid evidence or not? (7) VAR-001-4 R2 is redundant with currently enforceable TOP-002-2.1b R10 and R11. R11 already requires the TOP conduct seasonal, next-day, and current-day studies or assessments to determine SOLs and R10 requires the TOP to operate within those SOLs. Remember from our response in bullet (1) that FAC-011-2 and FAC-014-2 collectively require those SOLs defined by the TOP to consider pre-contingent and post-contingent voltages and voltage stability per the RC SOL methodology. Furthermore, some of the contingencies must include Category C contingencies that cause stability issues. There are similar requirements in the proposed TOP-002-3 to perform an assessment and operate within SOLs. We suggest revising R2 to remove this overlap. (8) We disagree with including the list of reactive devices in VAR-001-4 R2. It is simply not needed and is not complete either. If a TOP is not aware of the types of tools and equipment it has available to control voltage, there are more serious issues surrounding the TOP's certification. Furthermore, it might create the unintended consequence of compelling load shedding to maintain a steady-state voltage limit. If the TOP must follow its plan in R1 to operate within steady-state voltage limits by operating "voltage regulation devices" (which includes load shed) in R2, wouldn't the literal interpretation mean that load would have to be shed because a steady-state 94% voltage was below the typical 95% steady-state limit. Obviously, this would be bad for reliability. A registered entity should never be put in a position of having to choose between compliance and reliability. (9) VAR-001-4 M2 refers to studies while VAR-001-4 R2 refers to assessments. If this requirement should persist contrary to our arguments presented in point (7), we suggest using NERC Glossary Term Operational Planning Analysis (OPA). An assessment is a vague term that has several meanings and no time boundaries associated with it. For example, "assessment" is used in the TPL standards, which mean it could go out 10 years. While we understand there would be no reasonable expectation for a TOP to perform an assessment 10 years out, there could be inconsistent compliance applications because one auditor believes an assessment should cover the next day and another believes it should cover the next week. OPA is specific and bounded by time. Furthermore, use of this term would make the standard consistent with IRO-005-4, IRO-008-1, IRO-010-1a, TOP-001-2, TOP-002-3, and TOP-003-2. (10) VAR-001-4 R3 should be modified to state the TOP shall specify the criteria that will exempt generators from maintaining the voltage schedule. The TOP is not the enforcement authority and cannot exempt another responsible entity from compliance. We are concerned the language used will not be approved by FERC and result in a subsequent directive. (11) Part 3.1 of VAR-001-4 would appear to meet the paragraph 81 criterion on reporting. The criterion states that the requirement should be retired if it "obligates responsible entities to report to a Regional Entity, NERC, or another party or entity". Clearly, the GOP would be "another party or entity". The GOP should be able to simply self-determine from the criteria provided by the GOP that it satisfies the criteria. The TOP will be able to see if the GOP is following the voltage schedule from the telemetry. If there is a question, the TOP would call the GOP. (12) While the language in VAR-001-4 R4 is clear that the TOP must have criteria for granting exemptions, the associated language in VAR-001-4 Measure M4 states that the "temporary exemptions may be

provided". Please modify the language in the measure to be clear that the temporary exemptions will be provided if the criteria are met. Otherwise, the measure sounds like the TOP has discretion in granting the temporary exemptions. (13) VAR-001-4 R4 should be modified to require the TOP to only provide a voltage schedule to generators that are capable of controlling voltage. As it literally reads now, the TOP must provide a voltage schedule "to be maintained by each generator". This would include even small generators that simply do not have the size to control voltage. As an example, a 1 MVA generator connected to a 138 kV bus should not be expected to control to a voltage schedule because it simply will never be able to maintain the voltage schedule. One potential solution to address this problem is to insert BES before generator in the requirement. Once the new definition is in effect, it would be clearer that voltage schedules must be provided only to generating units 20 MVA or greater in size and or aggregate generating plants 75 MVA or greater in size. (14) It is unnecessary to require the TOP to direct the Generator Operator to comply with the voltage schedule with the AVR in voltage control mode in VAR-001-4 Part 4.1. It is redundant with VAR-002-3 R2 which compels the GOP to follow the voltage schedule. If drafting team feels the "directive" language is necessary in VAR-001-4 Part 4.1, then VAR-002-3 R2 should be removed because it would be redundant with TOP-001-1a R3 (existing) and TOP-001-2 R1 (pending regulatory approval). Both require the GOP to follow the directives of its TOP. (15) Contrary to the rationale box for VAR-001-4 R5, this requirement is clearly redundant with TOP-006-2 R1 which requires the TOP to know the status of all generation and transmission resources available for use and VAR-002-3 R3 which requires that GOP to notify the TOP of a change in the status of the automatic voltage regulator (AVR) and power system stabilizer (PSS). Since voltage control is one of the primary responsibilities of the TOP, it can be safely assumed that a transmission resource would have to include reactive power resources. Thus, the VAR-001-4 R5 is at least partially redundant with TOP-006-2 R1. How would a generation resource not include the status of the AVR and PSS? The drafting team appears to be interpreting TOP-006-2 R1 outside of the standards development process since interpretation of TOP-006-2 R1 was not included in the scope. If the drafting team does not believe an AVR or PSS is covered in TOP-006-2 R1, the appropriate course of action would be to submit a request for interpretation of TOP-006-2 R1 to verify the interpretation. If industry would disagree through the ballot process, then the interpretation would clearly obviate the need for the requirement for the remaining parts of the requirement. Finally, we can understand why the drafting team may want to emphasize reporting changes in status of the PSS and AVR but VAR-002-3 R3 compels the GOP to report the changes to the TOP already. Please strike VAR-001-4 R5 since it clearly meets the P81 criteria regarding redundancies. (16) Please clarify VAR-001-4 R6 that the TOP must consider the safety, equipment, statutory, and regulatory requirements on the GOP when specifying GSU transformer tap changes. (17) The compliance section needs significant revision. This section does not look like a final standard and is missing much of the boiler plate language. (18) VAR-001-4 VSLs: Overall the VSLs need significant work and do not look like final VSLs. For example, the Severe VSL for R2 mentions that the TOP does not perform assessments and, therefore, does not have policies and procedures implemented. R2 does not require policies and procedures. R1 does. The same Severe VSL also has a vague statement at the end stating "a lack of real-time operation," which is also classified as Severe. How does this relate to the requirement? The VSLs for R4 are inconsistent. One mentions tolerance bands and the other does not. Furthermore, failure to provide a voltage schedule to a 1000 MVA generator on a 500 kV voltage constrained line has a much greater impact on reliability than failing to provide a voltage schedule to 25 MVA generator on a 138 kV line. The former would miss more of the requirement than the latter. The bottom line is that there is an opportunity to provide more graduated VSLs than two levels. Four should be provided for R4. (19) VAR-002-3 R2 will be problematic for some GOPs because it does not reflect the characteristics of the voltage schedule provided by some TOPs. For example, some TOPs provide an hourly average voltage schedule to avoid the need for notification for every time the GOP drifts out of schedule. How would R2 be applicable in this situation? Would it only apply for the first 15 minutes of each hour looking back at the last hour? Please modify the requirement accordingly to address this issue. (20) The VSLs for VAR-002-3 R2 are too severe. Failure to provide an explanation to the TOP for failure to provide an explanation to modify voltage per Part 2.3 should be a Lower VSL not a Severe VSL. The TOP will have telemetered voltage values and will be able to see that voltage has not been modified. Thus, the TOP will be aware of the issue and will be able to call the GOP to find out what is happening or make other arrangements to modify voltage. (21) We suggest that the VAR-002-3 R2 should use different language than "as directed by the Transmission Operator". Compliance personnel may read this to mean this is a directive. If this is directive, then TOP-001-1a R3 would also apply. In essence, the language creates the opportunity for double jeopardy because failure to follow the voltage schedule

would be a violation of VAR-002-3 R2 and could be viewed as a violation of TOP-001-1a R3 for failure to follow the directive. Similar issues exist in the subparts of the requirement. (22) The VSLs for VAR-002-3 R4 appear to be intended for VAR-002-3 R2. (23) The VSL for VAR-002-3 R5 states that a technical justification must be provided for why the GOP did not implement that tap changes. No such requirement exists in the standard. The GOP could provide a safety or statutory reason for not changing the tap which are not technical justifications. Please revise the VSL accordingly.

Yes

We believe the notification should not be required until one hour after the generator has drifted from the voltage schedule or the PSS or AVR has changed status. This will give ample time for the generator to make adjustments to return to the voltage schedules, return the PSS or AVR to service or determine that it will be unable to return the voltage schedule or return the PSS or AVR to service. Then the GOP can notify the TOP. Furthermore, the TOP will be monitoring voltage and can call the GOP in the interim if they need an update on why the voltage schedule has drifted. This will also allow ample time for the TOP to switch reactive devices should they be needed which will help return the generator to voltage schedule and increase its dynamic reactive reserve.

We have no specific additional recommendations beyond those provided in earlier questions. Thank you for the opportunity to comment.

Individual

Andrew Z. Pusztai

American Transmission Company, LLC

No

ATC doesn't have any recommended changes to VAR-001 R1. However, VAR-001-4, M1 states "the policies and procedures must detail how criteria for steady-state and voltage stability limits are used in the [TOP's] assessments …" [emphasis added]. This language should be modified to reflect the wording of the requirement, which only requires that the TOP's policies and procedures specify the criteria, not the manner in which the criteria is used in an assessment. A suggested change is: "the policies and procedures must detail the steady-state and voltage stability limits criteria to be used in the [TOP's] assessments of the system." VAR-001-4, R2 and its sub-requirements are duplicative of approved future standards TOP-001-2 R7 though R11 and TOP-002-3 R1 and R2. TOP-001-2 requires the TOP to identify and operate within SOLs and covers VAR-001-4, R2.1. The NERC definition of SOL includes both voltage stability and steady-state voltage limits. The argument that R2.1 is focused on directing reactive resources misses the point that the requirement is designed to ensure that the system is operated within SOLs. VAR-001-4 R2.1 specifies in detail what the TOP will be doing to ensure compliance with TOP-001-2 R9 through R11. TOPs should not be subjected to potentially violating two standards that cover the same ground. Similarly, TOP-002-3 R1 requires TOPs to have next-day assessments and TOP-002-3 R2 requires the TOP to develop a plan to operate within SOLs. The plan under TOP-002-3 R2 would, by necessity, include scheduling reactive resources, when necessary, to ensure SOLs will not be violated. If the comment above regarding VAR-001-4 R2 is not accepted by the ad-hoc team, the following comments on VAR-001-4 R2 should be considered: VAR-001-4, R2 does not specify "real-time and day-ahead assessments" as noted in the R2 rationale statement. The word "assessments" in R2 is not modified by any accompanying descriptor. R2 should be edited to add "real-time and day-ahead" prior to "assessments". VAR-001-4, R2.2 states that the list of options "is not limited to" the methods mentioned. However, given R2.1 specifically calls out load shedding and R2.2 does not specifically state this, it is likely that a future auditor will note this difference and state that load shedding is not acceptable under R2.2. Therefore, R2.2 should explicitly include load shedding, if necessary, as another acceptable tool in the day-ahead plan. VAR-001-4 R3.1 states that the TOP "shall notify the associated Generator Operator" but M3 states that the TOP is to have evidence showing that it notified "the associated Generator Owner". This discrepancy should be corrected. VAR-001-4 M3 places too high of a burden on the TOP for a GOP AVR issue. Specifically, the TOP is made accountable for tracking temporary exemptions granted to a GOP when the GOP calls to state that their AVR is no longer in automatic mode or is no longer controlling voltage. Since no standing exemption has been granted to the GOP (hence the phone call), the compliance obligation to show that an exemption was granted should rest on the GOP through VAR-002-3 R1 and/or R2. VAR-001-4 R4 seems to have a potential inconsistency between the

parenthetical statement and the balance of the requirement. It is suggested that R4 be rewritten and simplified as follows: “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band at the interconnection point between the generator facility and the Transmission Owner’s facilities, or at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion, to be maintained by each generator.” Other than our comments on VAR-001-4 R4 noted in the preceding paragraph, we agree with and fully support the current wording of VAR-001-4 R4. VAR-001-4 R5 conflicts with VAR-002-3 R3/M3 because VAR-001-4 obligates the TOP to know the status of all AVRs and PSSs but VAR-002-3 does not obligate the GOP to report status or capability changes of AVRs and PSSs if the duration of change is less than 15 minutes. VAR-001-4 R5 should be clarified to state that the TOP is dependent on the GOP to report status of AVRs and PSSs. Suggested edits are as follows: “R5. The Transmission Operator shall know the status of: 1) all transmission Reactive Power resources in its system, and 2) automatic voltage regulators and power system stabilizers as communicated by the Generator Operators in its system.” VAR-001-4 M5 should read: “The Transmission Operator shall have evidence to show transmission Reactive Power resources are being monitored” since that is the language of the requirement.
Yes
See comment in response to question #2 above where 15 minute window in VAR-002-3 R3 conflicts with VAR-001-4 R5.
ATC believes a standard is not required to address this issue.
Group
DTE Electric
Kathi Black
No
No Comments
No
No Comments
No
No Comments
It is our opinion that any communication and coordination between the TOPs and GOPs that affects reliability should be included in the standard.
Individual
Andrew Z. Pusztai
American Transmission Company
Yes
ATC does not believe that placing both VAR Standards on one ballot is a good practice, and in fact, only VAR-001 is applicable to ATC as a TO/TOP. For future postings, please post as two separate balloted Standards. This can also create a conflict such that an entity can support one and not the other, resulting in a dilema as to vote affirmative or negative that would affect one or the other Standard negatively.
Individual
Brian Shanahan
National Grid Transmission Operations
Agree
NPCC Regional Standards Committee
Individual
Catherine Wesley
PJM Interconnection

No
Yes
Specific to VAR-001-4, PJM questions why the RC is included in the standard since the responsibilities to comply with all the requirements are with the TOPs actions. If there are no actions for the RC, PJM supports the RC being removed from the standard. Included in R1 is use of the term 'establish' specific to policies and procedures that are required to be implemented. PJM supports deletion of that specific word because there are several other standards which specifically address establishing methodologies, in turn, procedures and processes, that define voltage levels, reactive power flow, steady state limits and voltage stability limits. Those standards included TPL-001, 002 (footnote a, Table1), FAC-010-2.1 and FAC-011-2 (R1, R2, R2.2) and FAC-014-2 (R1, R2, R3, R4).
No
Individual
Diane Barney
New York State Dept of Public Service
Yes
It is premature to be voting at all for the standard at this point in the process. Two major pieces of information are missing. First, the SAR has not been adopted, so we do not know if the proposed standard conforms to an adopted SAR. Second, the proposed standard was drafted by a small team of subject matter experts and has not yet been subject to a NERC wide critical review. Therefore, we do not yet know if there is a fatal flaw in the standard for some system(s) across NERC not represented by the SMEs, or if there is an outstanding idea to improve the draft standard.
Individual
John Brockhan
CenterPoint Energy Houston Electric LLC.
No
Yes
CenterPoint Energy appreciates the efforts of the informal development team in providing the industry the proposed language changes to the VAR Standards incorporating the remainng FERC Directives. CenterPoint Energy offers the following comments and proposed changes for consideration and discussion to better align the standard language to the functions of Transmission Operator and Reliability Coordinator as described in the NERC Reliability Functional Model Technical Document Version 5 in relation to the coordination and control of voltage. The Transmission Operator has policies to monitor and control static reactive devices under its range of vision and control only. The Transmission Operator also has policies for requesting reactive output from generation units already online for voltage control; however, the redispatching of generation for reliability purposes is the responsibility of the Reliability Coordinator. Since the Transmission Operator cannot control all of the generation, then the Transmission Operator is unable to perform a complete or valid Operational Planning Analysis and modify generation dispatch to maintain operational limits both steady state and dynamic. Furthermore, any maintenance outages on static reactive devices need to be reviewed and approved by the Reliability Coordinator. Also, it is unclear to the industry what kind of action is expected from the Transmission Operator based on the status of the reactive power resources since the Transmission Operator cannot dispatch other units to make up for lack of AVR or frequency control in a generator. It would seem to be crtitical for the Balancing Authority and Reliability

Coordinator to be notified of status or capability change on any generator Reactive Power resource. CenterPoint Energy recommends the requirements be modified as follows: VAR-001-4 R1. Each Transmission Operator shall have documented policies or procedures that are implemented to monitor voltage levels and reactive power flows (MVAR flows) and maintain the voltage within limits by controlling reactive devices under its purview or by directing online generation. R1.3 Each Transmission Operator shall provide a copy of its local documented policies or procedures to its Reliability Coordinator. R2. Each Reliability Coodinator shall perform assessments… R3. The Reliability Coordinator shall specify criteria… R3.1 In the event a Reliability Coordinator approves a generator as satisfying the criteria, it shall notify the associated Transmission and Generator Operator. R4. Each Transmission Operator, in coordination with the Reliability Coordinator, shall specify a voltage or Reactive Power schedule and tolerance band at the interconnection point between the generator facility and the Transmission Owner's facilities to be maintained by each generator. R4.1 The Reliability Coordinator shall provide the voltage or Reactive Power schedule to the associated Generator Operator. The Transmission Operator shall direct the Generator Operator to comply with the schedule in automatic voltage control mode (AVR in service and controlling voltage). R5. The Balancing Authority and the Reliability Coordinator shall know the status of all transmission Reactive Power resources, including the status of voltage regulators and power system stabilizers. R6. After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Owner, in coordination with the Reliability Coordinator, shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes, and technical justification for these changes. VAR-002 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) unless the Generator Operator has notified the Reliability Coordinator of one of the following…
No
Individual
Steven Mavis
Southern California Edison
Yes
SCE commends the drafting team on the work that it has done to address the FERC Order 693 Directives to modify VAR-001 and VAR-002. The draft standards are productive starting points for further clarification and refinement. Additional clarification is required before SCE can support the standards, for example, in VAR-001-4, Requirement 1.1, the use of the term "system assessment" is vague and ambiguous. The standards drafting team should provide further precision in explaining the intended meaning of this term.
Yes
The draft standards are productive starting points for further clarification and refinement. Additional clarification is required before SCE can support the standards, for example, in VAR-001-4, Requirement 1.1, the use of the term "system assessment" is vague and ambiguous. The standards drafting team should provide further precision in explaining the intended meaning of this term.
No
SCE commends the drafting team on the work that it has done to address the FERC Order 693 Directives to modify VAR-001 and VAR-002. The draft standards are productive starting points for further clarification and refinement. Additional clarification is required before SCE can support the standards, for example, in VAR-001-4, Requirement 1.1, the use of the term "system assessment" is vague and ambiguous. The standards drafting team should provide further precision in explaining the intended meaning of this term.
Group
IRC/Standards Review Committee
Gregory Campoli

Yes
We do not think the proposed requirement in VAR-001-4 which now includes RC as a Responsible Entity adequately addresses the directives. Please see our comments (b) under Q2.
Yes
VAR-001-4 a. It is unclear on the main objective and the target reliability outcome of Requirement R1, and the intent of the proposed changes in relation to the directive in P. 1868 in Order 693. We interpret R1 to require a TOP to have documented policies or procedures in place that can be implemented to establish, monitor, and control voltage levels and Reactive Power flows (Mvar flows) within limits as defined in Parts 1.1 to 1.3. However, Part 1.1 requires that the policy/procedure shall include criteria used in system assessments. It is unclear as to what "system assessments" means? Does it mean assessments of the TOP area's reliability performance with respect to the voltage levels and Mvar flows and any limits (SOLs, IROLs, reactive capability)? Or does it mean the system assessment that yields the "limits" (SOLs, IROLs, reactive requirements, etc.) which provide the target and guideline for the establishment, monitoring, and control of voltage levels and Mvar flows? It is also unclear as to what the "criteria of the assessments" means in the second sentence of Part 1.1, especially in relation to "established steady-state limits, voltage stability limits, etc. if the answer to the above question is that the assessments were meant to yield the "limits", then there is a confusion as to what limits are intended to be developed in relation to the "established" limits. In Order 693, P. 1868, FERC directs the ERO to modify VAR-001-1 to include more detailed and definitive requirements on "established limits". However, it is unclear what this directive really means. Does it mean more details and definitive requirement on stipulating voltage and reactive requirements with respect to established limits (SOLs, IROLs, voltage level, etc.) or does it mean more details on limits (boundaries) of the interconnection voltages as implied by Requirement R8 of the existing VAR-001 standard? Requirement R1 does not provide this clarity since Part 1.1. refers to "established steady-state limits, voltage stability limits", which is different than the "established limits" presented in the R8 of the existing VAR-001 standard. It is our understanding that as a general practice, a TOP will assess if there exists any reliability concerns that can be caused by voltage levels and instability to develop operating limits (SOLs or IROLs) to ensure reliable operations. The operating limits may be expressed in voltage level, pre and post-contingency power flow level, reactive support requirements or any combination of the above. The operating limits so established will provide a linkage between the SOL, voltage level and reactive power capability/reserve requirement either explicitly or implicitly. System Operators will monitor the key parameters including voltage level, power flow level and reactive power flow/reserve/capability to meet the SOL boundary conditions. Requirement R1 as presented does not provide any clarity as to what is it that in the practice that a TOP is required to meet. Requirement R1 as presented is unclear on its objective and the exact actions required of the Responsible Entity as there are a number of "criteria" and "limits" in the main requirement and its Part 1.1 that are confusing and subject to different interpretation. R1 as presented will leave a Responsible Entity not knowing what it needs to do to meet Requirement and its reliability objectives. We suggest the SDT to revise R1 and its parts to clarify its intent, especially on the who, the specific actions and expected outcome according to the results-based principle and guideline. Note that with respect to Part 1.1, Measure M1 asks for evidence that proves voltage is currently being monitored. Such evidence may include, but is not limited to: 1) proof that points are telemetered, 2) alarms are functioning, and 3) during events of low or high voltage the policies and procedures are being followed to respond to control voltage levels. These examples of evidence do not reflect the scope and depth of R1 and Parts 1.1 (the criteria and the assessment parts). We also suggest the drafting team review TOP-002 Rquirements R1, R8 and R10 as they relate to voltage limits. R1 obligates us to have plans to meet system conditions, similar to the VAR-001 R1. R8 requires us to meet voltage and reactive limits, R10 requires us to meet all SOL's and IROL's which are inclusive of voltage steady state and stability limits. The drafting team also needs to resolve the use of the term 'establish' as it relates to FAC-014 which requires us to establish SOL/IROL's that include voltage limits. b. FERC directive 1855 directs NERC to include Reliability Coordinator as applicable entities and include a new requirement(s) that identifies the reliability coordinator's monitoring responsibilities. In the Informal Consideration specific to this directive presented in the White Paper, it is indicated that: "Although some entities in Texas provided feedback that certain RCs perform functions equivalent to a TOP, the informal development group did not expand VAR-001 to give parity to TOPs and RCs." R2 as presented appears to go beyond the FERC directive that RC be

included to be assigned the "monitoring responsibility" as R2 now requires the RC to "….perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1". The inclusion of RC in this requirement is also inconsistent with the view presented in the Informal Consideration with respect to parity between TOPs and RCs. Parts 2.1 and 2.2 stipulates a number of tasks for the TOPs with respect to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow, and to ensure that sufficient reactive resources have been scheduled to meet acceptable day-ahead voltage limits identified in Requirement R1. These tasks do not involve the RC. It thus raises a question on the need for including RC in the main requirement when it is not required to take further actions to assure its assessment of "sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions" can be fulfilled in real-time operations. We believe the inclusion of RC in this requirement is inappropriate, or if there is a compelling reason to include the RC, then Parts 2.1 and 2.2 are insufficient to assure the RC's assessment can be supported in real-time operations. c. Requirement R2, Part 2.1 stipulates that: "Each Transmission Operator shall operate or direct the real-time operation of devices necessary to regulate transmission voltage and reactive flow necessary to regulate transmission voltage and reactive flow which may include…" We do not understand this requirement as it contains two sets of "necessary to regulate transmission voltage and reactive flow". If this is a typographical error, please correct it. d. We do not have any concerns or comments on R3 and R4 as presented, but suggest that their order be reversed since the exemption criteria (R3) should appear after the overarching requirements for GOs to maintain a voltage or Reactive Power schedule and tolerance band. e. R5: we suggest to change the word "know" to "monitor". This provides an active approach, which is appropriately reflected by the wording in Measure M4. f. In the Compliance Section, there is no requirement for the RC to retain evidence for Measure M2. Further, there is no requirement for the TOP to retain evidence for Measures M5 and M6. g. VSL for R1: There is no explicit requirement in R1 for the TOP to provide a copy of the assessment criteria to its RC or neighbor TOPs since the assessment criteria are supposed to be included in the policy or procedure document. The Low VSL thus serves no purpose whatsoever. Further, from the standpoint of meeting the intent of Requirement R1, there is little to no difference between having documented policies or procedures which do not include any of the elements stipulated in Parts 1.1 to 1.3, and having no documented policies or procedures at all. In the former case, the documented policies or procedures provide absolutely no value, and hence is it a total violation of the intent of R1. We suggest to remove the Low VSL and the High VSL, and keep the Moderate VSL and revise the Severe VSL to include the condition presented in the High VSL as an "OR" condition under the Severe VSL. h. VSL for R2: Throughout R2, there are not specific requirements for having policies and procedures implemented to have sufficient Mvars. R2 requires the TOP and RC to perform assessments on their respective areas in order to ensure sufficient reactive resources are available for scheduling to maintain voltage stability under normal and contingency conditions. Part 2.2 stipulates the requirements for scheduling reactive resources to meet the reactive requirements resulting from day-ahead assessments. Part 2.1 stipulates the requirement to operate or direct the real-time operation of devices necessary to regulate transmission voltage and reactive flow. While the Moderate VSL which address non-compliance with Part 2.2 and appears to be reasonable, the Severe VSL does not correspond to how Part 2.1 is presented. Further, the condition that "A lack of real-time operations is also severe." seems irrelevant to Part 2.1 when it comes to operating or directing the real-time operation of devices necessary to regulate transmission voltage and reactive flow. There can be no lack of real-time operations, but a TOP may totally ignore the operations or directing the operations of devices necessary to regulate transmission voltage and reactive flow. Finally, there is no VSL for the RC failing to meet R2. Hence, RC is assigned a responsibility but its compliance is not measured and there is no VSL to determine its non-compliance. i. VSL for R5: The conditions in the Moderate and High VSLs are irrelevant to the requirement. R5 requires a TOP to know (monitor) the status of all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. The Moderate VSL makes reference to a "stable area", which is totally irrelevant and out of context of R5. In the High VSL, the TOP not knowing "the status of important equipment in weaker areas that were identified in assessments as part of R1." are also irrelevant and out of context of R5. Finally, there is no Severe VSL. It begs the question on: what constitutes a total failure to comply with Requirement R5? j. VSL for R6: The Low VSL should have an "is", not an "are". Also, there is no Severe VSL and hence there is no condition to constitute a total failure to comply with Requirement

R6. VAR-002-3 k. Measure M2: A good part of M2 presents the scenarios where a Generator Operator may not be able to meet voltage schedule or comply with the TOP's directive, and how a GOP may mange the situations. The description part does not belong to a Measure, and should be moved to the Background Information Section that a Results-based standard template has made provision for. l. Measure M3: the latter part of M3 is not presented in a manner to require the evidence to demonstrate compliance. We suggest M3 be revised to: The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any of the changes identified in Requirement 3, or evidence that the status had been restored within the first 15 minutes of such change. m. For all Measures, there are no examples of evidence provided. It will be appropriate if after each of the "evidence", additional wording "such as log, recording, or other documents" so as to be consistent with the way measures are presented in other standards. n. Evidence Retention: It will be appropriate to reference the Measure Number for the GO's and the GOP's data retention requirements.
No
NERC's Reliability Issue Steering Committee (RISC) is charged to address emerging reliability issues and recommend preferred approaches to manage such issues. Whether or not the TOP/GOP voltage coordination issue should rise up to a risk level that warrants special attention by the industry, and whether the appropriate way to address this issue in a standard project will be best evaluated and determined by the RISC. We suggest that the SDT nominate this issue to the RISC for its deliberation.
Individual
Clay Young
SCE&G
Yes
1. There is a general concern with this proposed standard that it will create further administrative burden for the TOP/RC as well as the back office staff. Additionally, the opportunity exists that the number of calls between the GOP and TOP will increase without materially enhancing BES reliability. Further, how would these standards be used to evaluate the compliance of a unit which has their AVR taken off auto for testing? 2. VAR-001-4 Comments: R1.1.2. Each Transmission Operator shall Delete: "provide a copy of these Comment Form-2013-04 VAR-001-4/VAR-002-3 July 2013 Page 2 of 5 https://www.nerc.net/nercsurvey/Survey.aspx?s=c645f86a592f47c9ae532b7c11d92eb1&Re... 9/3/2013 documented policies or procedures to adjacent Transmission Operators" make plans available with a written request so entities requiring documents have access. R1.1.3. Each Transmission Operator shall Delete:"provide a copy of these documented policies or procedures to its Reliability Coordinator." make plans available with a written request so entities requiring documents have access. R2. Each Transmission Operator and Reliability Coordinator shall perform assessments on their respective areas in order to ensure sufficient reactive resources are available Delete: "for scheduling" to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1. R2.2.2. As a result of the assessments, each Transmission Operator shall ensure that sufficient reactive resources Delete: " have been scheduled" Add: "are available" to meet acceptable day-ahead voltage limits identified in Requirement R1. Sufficient reactive resources may include, but is not limited to reactive generation scheduling; transmission line and reactive resource switching; and controllable load. R5. The Transmission Operator shall know the status of Delete:"all transmission" Add: " BES" Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. Request that the SDT review R5 to ensure that it is not a duplicative of a TOP standard. M5. The Transmission Operator shall have evidence to show Reactive Power resources are being monitored. Evidence may include, but is not limited to screen shots of EMS/SCADA data, alarms, and phone logs. In the event the monitoring system does not work, each Transmission Operator should have a protocol in place to show these resources are being monitored. Request the SDT to add further clarification for AVR and PSS.
Yes
See answer to question 1.
Yes

See answer to question 1.
Group
Santee Cooper
S. Tom Abrams
No
No
We agree with the SERC Generation Subcommittee comments.
Individual
Thomas Hanzlik
SCE&G
Yes
1. There is a general concern with this proposed standard that it will create further administrative burden for the TOP/RC as well as the back office staff. Additionally, the opportunity exists that the number of calls between the GOP and TOP will increase without materially enhancing BES reliability. Further, how would these standards be used to evaluate the compliance of a unit which has their AVR taken off auto for testing?
Yes
R1.1.2. Each Transmission Operator shall Delete: “provide a copy of these Comment Form-2013-04 VAR-001-4/VAR-002-3 July 2013 Page 2 of 5 https://www.nerc.net/nercsurvey/Survey.aspx?s=c645f86a592f47c9ae532b7c11d92eb1&Re... 9/3/2013 documented policies or procedures to adjacent Transmission Operators” make plans available with a written request so entities requiring documents have access. R1.1.3. Each Transmission Operator shall Delete:“provide a copy of these documented policies or procedures to its Reliability Coordinator.” make plans available with a written request so entities requiring documents have access. R2. Each Transmission Operator and Reliability Coordinator shall perform assessments on their respective areas in order to ensure sufficient reactive resources are available Delete: “for scheduling” to maintain voltage stability under normal and contingency conditions in order to provide the voltage levels as defined in Requirement R1. R2.2.2. As a result of the assessments, each Transmission Operator shall ensure that sufficient reactive resources Delete: “ have been scheduled” Add: “are available” to meet acceptable day-ahead voltage limits identified in Requirement R1. Sufficient reactive resources may include, but is not limited to reactive generation scheduling; transmission line and reactive resource switching; and controllable load. R5. The Transmission Operator shall know the status of Delete:”all transmission” Add: “ BES” Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system. Request that the SDT review R5 to ensure that it is not a duplicative of a TOP standard. M5. The Transmission Operator shall have evidence to show Reactive Power resources are being monitored. Evidence may include, but is not limited to screen shots of EMS/SCADA data, alarms, and phone logs. In the event the monitoring system does not work, each Transmission Operator should have a protocol in place to show these resources are being monitored. Request the SDT to add further clarification for AVR and PSS.
No
Individual
Laurie Williams
PNM Resources, Inc.

No
Yes
PNM disagrees and cast a negative ballot vote due exclusively with the implementation timeframe of one calendar quater. One calendar quater does not appear to be enough time to prepare a documented policy or procedure for assessments that is required of Transmission Operators nor does it allow sufficient time for the newly applicable RC function to prepare its compliance documentation as well as ensure processes/procedures are established and working well prior to the effective date. Finally, Transmission Operators t which were not previously providing voltage/reactive tolerance bands will need additional time to establish this exchange with Generator Operators. PNMR suggests a minimum of 2 calendar quarters for implementation to ensure registered entities are not forced to self report non-compliance due to the extraordinarily short implementation schedule. PNMR has no issues with the wording in the standards and is otherwise in favor of the new proposed standards.
No
None.
Individual
Andrew Gallo
City of Austin dba Austin Energy
No
Yes
For requirement R1, Austin Energy proposes that the standard include generator “testing mode” in the exemption criteria. Austin Energy proposes the following for R1-first bullet item: ”That the generator is being operated in start-up, shutdown or testing mode pursuant to a Real-Time communication or a …….”
Yes
Austin Energy believes Requirement 2.1 is not focusing on the most useful metric for Transmission voltage stability. In the ERCOT Region, the Transmission Operators (Local Control Centers) monitor voltage on their Facilities and, when necessary, control the voltage by operating or directing the operation of reactive devices including reactive generation scheduling. The Generator Operator responds to requests from the Local Control Center for voltage support and notifies the Local Control Center if it is unable to provide voltage support. Asking the GOP to monitor voltage at the GSU and notify the TOP of certain deviations is somewhat redundant and not useful because the Local Control Center already monitors voltage at the system level and directs the Generator to alter MVAR output. Typically, in the ERCOT Region, the Generator and Generator Operator have no visibility into the larger system voltage and operate in a responsive mode. Generator equipment settings (Tap Settings & MVAR Settings) are set to meet the assigned voltage schedule under normal operating conditions and are adjusted only when a request for voltage support is received. Therefore, Austin Energy recommends altering the requirement to read “If the GOP is unable to meet the reactive support requested by the TOP due to equipment limitations it shall notify the Transmission Operator”, as already required in R2.3.
These comments apply to the VSLs (you did not provide an opportunity to do so elsewhere in this comment form): It looks like the VSLs for R2 show up for R4 and vice versa. R4 is merely a requirement to provide data, yet the VSLs address failing to maintain voltage schedules. On the other hand, the VSL for R2 has only a "severe" entry and penalizes the Registered Entity only if it fails to perform ANY sub-requirement (there are three). That doesn't seem correct. Finally, the VSL for R5 applies only if the Registered Entity does not perform BOTH requirements. That also appears incorrect.
Group
SPP Standards Review Group
Robert Rhodes

No
Yes
VAR-001-4 Replace ‘real time’ with ‘Real-time’ in the Purpose and throughout the standard. It is a NERC defined term. R1 requires the TOP to have policies and procedures that establish, monitor and control voltage levels and Reactive Power flows in the Operations timeframe. Is the requirement stating that the Transmission Operator must develop the voltage and reactive schedules in Real-time? This function is typically performed behind the scenes by Transmission Planners or other support staff. We suggest that the wording be changed by deleting ‘establish’. Additionally, the white paper states that the Operations timeframe is from Real-time up to one year in the future. Real-time, according to NERC Time Horizons document, is within one hour or less while Operations Planning is from day-ahead to up and including seasonal. We suggest this be revised to state the Real-time Operations thru Operations Planning time horizons. R1.2 and R1.3 are redundant with TOP-004-2, R6 and do not need to be repeated in this standard. We recommend deleting these two sub-requirements. In M1 insert ‘and controlled’ in the 6th line after ‘monitored’ such that the sentence states ‘…is currently being monitored and controlled.’ Also inisert ‘adjacent’ in front of Transmission Operator and add an ‘s’ to Operator in the next to last line. R2 requires voltage stablility assessments to be conducted by the TOP but no direction is given on how often these assessments must be performed. While we’re not asking the drafting team to place specific time limits on when assessments must be performed we would like to know what conditions would drive the need for performing a new voltage assessment. This should then be incorporated into the requirement. Also, are references to online assessments referring to Real-time snapshots for input into steady state voltage analysis or are they referring to dynamic voltage stability assessments? Given that it is stated in the Rationale Box for R2 that online assessments are not being specifically required in this standard, what kind of assurances does a TOP have that an audit team won’t expect the TOP to have such functionality available on the control room floor? The word ‘switching’ is left by itself in the listing of resources in M2. We’re not real sure what it refers to but would suggest that we delete capacitor banks and switching and replace it with transmission line and reactive resource switching. This recognizes that switching out a transmission line or a reactor bank serves the same purpose as switching in a capacitor bank. Also, delete the 2nd ‘provide’ in the next to last line of M2. R3 exempts GOPs from R4 but GOPs are not required to do anything in R4. The exemption should apply to VAR-002-3, R2. This is stated in the white paper on Page 8 in the first line under Requirement 3. In the 4th line of M3 ‘maybe’ should be ‘may be’. R4 requires the TOP to direct the GOP to follow the voltage schedule the TOP provided to the GOP. R2 of VAR-002-3 requires the GOP to maintain its assigned voltage schedule and the TOP does not need to direct the GOP to follow it also. This is redundant and should be removed. For consistency with the Measure, delete last sentence of M3. We recommend retiring R6 because it is simply a mechanism for adhering to the requirements in R4. R4 is more of a results-based requirement – follow the provided schedule. R6 is providing one option to assist in following R4. It should be deleted. The VSLs for R2 do not match the requirement. In fact, they add requirements which are not included in the standard. We recommend deleting the Moderate VSL for R2 and revising the Severe VSL to read The Transmission Operator does not perform assessments of their area. Unless the VSLs for R4 are spread out among all categories; did not provide to one GOP for Low, two GOPs for Moderate, three GOPs for High and four or more GOPs for Severe, we would suggest simply deleting the existing High VSL, leaving only the Severe VSL. The VRF shown in R5 does not match the VRF in the VSL table. One is Medium and the other is Lower. Which is it? The justification for the inclusion of power system stabiliizers in R5 is weak to say the least. Why does this equipment need to be highlighted and other equipment, such as capacitor banks and reactors, not? TOP-006-3 R1 requires the TOP to know the status of all generation and transmission resources within its area. R2 goes on to specifically include static and rotating reactive resources. It would appear that R5 is then duplicative with these requirements and therefore could be retired. If AVRs and PSSs need to be highlighted, they should be highlighted in TOP-006 and not in this standard. VAR-002-3 We have a concern that the use of Generator Operator in this standard appears as an attempt to change the definition of GOP to the operator inside the plant control room. Some of the functionality referred to in the standard specifically points to the plant personnel rather than the NERC defined Generator Operator. For example, controlling the AVR. This is something that a plant operator would do not the Generator Operator consolidating several plants at some remote location. This would be similar to field support personnel in a transmission setting. We suggest changing the responsibility to plant

personnel. We recommend replacing ‘directed’ with ’provided‘ in R2 and R2.2. The way the timing logic is written in R2.1 if a GOP is outside the tolerance band for longer than 15 minutes and the GOP has the capability to return to control, the GOP does not have to notify its TOP. Either the ‘and’ needs to be changed to an ‘or’ or the sub-requirement needs to be totally rewritten. Delete ‘associated’ when referring to TOPs in R3, M3 and R5. We recommend moving the VSLs from R4 to R2 with the following changes: LOW – When unable to maintain voltage or reactive power schedule the Generator Operator notified its TOP in more than 30 minutes but within 45 minutes. MODERATE – When unable to maintain voltage or reactive power schedule the Generator Operator notified its TOP in more than 45 minutes but within 60 minutes. HIGH – When unable to maintain voltage or reactive power schedule the Generator Operator notified its TOP in more than 60 minutes but within 75 minutes. SEVERE – When unable to maintain voltage or reactive power schedule the Generator Operator notified its TOP in more than 75 minutes or did not notify its TOP at all. We recommend changing the Severe VSL in R3 to: The responsible entity did not notify its TOP of a status or capability change as specified in R3. The provided VSLs for R4 probably belong to R2 and could be used there if the drafting team chooses to dispurse the severity of the violations across the VSL spectrum. We recommend the following for the VSLs for R4. LOW – The Generator Operator provided the data requested in R4 in more than 30 days but within 45 days. MODERATE – The Generator Operator provided the data requested in R4 in more than 45 days but within 60 days. HIGH – The Generator Operator provided the data requested in R4 in more than 60 days but within 75 days. SEVERE – The Generator Operator provided the data requested in R4 in more than 75 days or the Generator Operator did not provide the data at all. We recommend changing the Severe VSL in R5 to: The responsible entity did not perform the specified tap change and failed to provide the technical justification to its TOP as to why it did not comply with the request as required in R5.
Yes
Please see our comment in Question 2.
The information provided is not sufficient to make this determination. Additional, specific information regarding precisely what the issues are is needed.
Group
Bonneville Power Administration
Jamison Dye
No
Yes
BPA considers the impact of large renewable generation projects (asynchronous machines) in our interconnection requirements and recognizes the ability of these machines or their auxiliary devices to support voltage. BPA recommends the drafting team address renewable resource voltage control in VAR-002-3. BPA believes that VAR-001-4, Requirements R1.1 and R2 are redundant as they appear to overlap with existing Mandatory standards. FAC-011-2, Requirements R1, R2 and R3 establish that the RC Methodology includes process and pre/post contingency performance, including margins. FAC-014-2, R2 instruct the TOP to establish SOL’s in accordance with the RC Methodology. Because of this, BPA believes that VAR-001-4, R1.1 is already established in these FAC standard requirements. Additionally TOP-002, R11 requires the TOP to perform seasonal, next day and current day studies to determine SOL’s. Because of this, BPA believes that VAR-001-4, R2 appears to be redundant. BPA recommends the elimination of R1.1 and R2 of VAR-001-4 to remove this redundancy.
No
Group
PacifiCorp
Kelly Cumiskey
No

Yes
PacifiCorp would like to point out that there is no uniform method with which voltage schedules are established in R1 of VAR-001-4. If there isn't anything specific that a TOP is expected to look at or address when drafting the procedures or policies for establishing voltage schedules, it is not clear to PacifiCorp how the policies and procedures will be measured. Moreover, if the policies and procedures only include a TOP's own criteria for the studies used to establish voltage schedules, how does requiring a documented policy and procedure in the reliability standard (referenced on page 7 of the NERC White Paper) "remove the opportunity for auditors or other parties to scrutinize a TOP's own system studies"? Additionally, PacifiCorp would like more clarity with respect to how real-time reactive deficiencies are expected to be identified in R2 of VAR-001-4. The rationale for R2 states that the informal development team believed the requirement should not require a utility to purchase new online simulation tools but in the absence of such tools, it is not clear to PacifiCorp how real-time reactive deficiencies can be captured.
No
Individual
Ryan Walter
Tri-State Generation and Transmission Association, Inc.
No
Yes
In the draft of VAR-001-4 R2 the use of the word 'schedule' when referring to all reactive resources is unclear. This is in conjunction with the Compliance response to question 2 part 2, "…provide the documentation for the day ahead scheduling in addition to documentation supporting that it was scheduled…" found in the NERC document Draft Reliability Standard Compliance Guidance for VAR-001 and VAR-002 dated July 8, 2013. Is it the ad hoc group's intent to have a schedule for all reactive resources including capacitors, reactors, Static var Compensators and generators? Is the schedule meant to be similar to that of a generator (i.e. Insert capacitors at 1.0pu and remove at 1.05) or on a time base? Is schedule just supposed to take into account availability of all reactive resources? For VAR-001-4 R4 Tri-State Generation and Transmission Association, Inc. (TSGT) believes it would be beneficial to include a feedback loop from the GOP to the TOP when there are generator capability concerns with regards to the TOP's supplied voltage schedule. Also TSGT believes the statement "(at either the high or low side of the Generator Step-Up transformer at the TOP's discretion)" currently in VAR-001-4 R4 to should be changed to "(at an agreed upon metering point to which the GOP has direct access)." For VAR-001-4 R6 why did the ad hoc group not change the consultation requirement from GO to GOP? Tri-State believes that this information would better serve the GOP function particularly at Co-Owned facilities. This change would not have a negative effect on the reliability of the BES would reduce duplicative notification to be administered by the TOP. TSGT suggests the ad hoc group add the statement "Notification to the TOP is not required if the GOP can return to schedule" to the end of VAR-002-3 R2.1 to provide further clarification when notification is needed. For VAR-002-3 R5 TSGT believes the TOP should consult with the GOP rather than the GO to better align requirement R5 with its subrequirement R5.1.
No
TSGT does think a feedback loop would be beneficial for VAR-001-4 R4 as noted in our comment to question 2.
Individual
Denise Yaffe
Southern California Edison
No

No

No

SCE commends the drafting team on the work that it has done to address the FERC directives in Order 693 to modify VAR-001. The draft standard is an excellent baseline/ starting point to accomplish this endeavor the draft VAR-001-4 standard, currently out for comment and balloting, still needs additional clarity and refinement before it can be moved forward and go into effect. An example of the need for clarity can be found in the Requirement 1.1, and the use of the term "system assessment". The drafting team should better describe this term as it is somewhat ambiguous in nature.

Group

NAGF Standards Review Team

Patrick Brown

Yes

VAR-001: 1. The rationale statement for R1 of VAR-001 says that it, “will allow each Transmission Operator (TOP) to establish its own policies and procedures,” regarding voltage schedules and tolerance bands. This wording does nothing to prevent specifying an unreasonably-tight bandwidth (e.g. +/- 0.5%), as some parties are now doing. We suggest that R1.1 end as follows, “…voltage schedules along with associated tolerance bands of not less than 1.5% of the schedule voltage unless technically justified.” There may be some resistance to making the standard prescriptive, but it’s not a burdensome requirement, and it would be unfortunate to update the standard without addressing known abuses of the present version. 2. The statement, “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band (at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion) at the interconnection point between the generator facility and the Transmission Owner's facilities,” in R4 of VAR-001 has a semantics glitch in that there is just one interconnect point. That is, mandating control at the interconnection eliminates any discretion in making the high vs. low-side selection. We suggest saying instead, “Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band, at the agreed upon metering point to which the GOP has access.” This will typically be either the transmission bus or the generator terminals. If the TOP specifies this as the TO’s “transmission bus”, the TO should be required to make the same voltage point used by the TOP available to the GOP to ensure both are seeing the exact same voltage. Additionally, there needs to be a feedback loop from the GOP to the TOP regarding the voltage schedule. This does not mean we want to spark a debate every time a schedule is provided, but simply add a step that allows a GOP to provide feedback regarding the feasability of the schedule. A recommended R4.2: R4.2 The Generator Operator shall review the voltage or Reactive Power schedule and tolerance band provided by the Transmission Operator and inform the Transmission Operator of any conditions that would prevent the Generator Operator from complying with the schedule or tolerance band, along with the technical basis for that determination. The question that then comes up is, what does the TOP do if the GOP cannot comply with the schedule as presented? Recommended R4.3: R4.3 If the Generator Operator is unable to comply with the voltage or Reactive Power schedule or tolerance band as provided by the Transmission Operator, the Transmission Operator shall (a) modify the voltage schedule within the parameters established in the documented policies and procedures established in R1, taking into account the Generator Operator’s limitations, or (b) exempt the Generator Operator from following the voltage schedule or tolerance band using the criteria established in R3. 3. We’d like to see R6 of VAR-001 changed to, “After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes that is mutually agreed, and technical justification for these changes.” That is, the change should normally wait until it can be rolled into a scheduled downtime event. We sometimes get people studying things for numerous months, then when finally reaching a decision wanting to know why we can’t make the change in the next day or two. VAR-002: 1. We suggest changing, “The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to

operate a generator in the automatic voltage control mode as specified in Requirement 1," in M1 of VAR-002 to a more semantically neutral, "The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it did not operate a generator in the automatic voltage control mode." 2. The SRT recommends the following changes to R2, for clarity; R2. Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule3 (within each unit's ratings or capabilities4) as directed by the Transmission Operator. [Violation Risk Factor: Medium] [Time Horizon: Real-time Operations] 3. We suggest corresponding changes to R2.1. Note that the time frames are left blank in our recommendation, as there is still much discussion within the industry as to what an approporitate timeframe would be; If the system bus voltage drifts out of schedule, each Generator Operator shall notify its associated Transmission Operator within __ minutes when both of the following conditions are met: 1) the GOP has been operating outside of the prescribed voltage or Reactive Power schedule tolerance band5 for __ minutes; and 2) the GOP is no longer able to return to its voltage or Reactive Power schedule. Notification to the TOP is not required if the GOP can return to schedule. 4. In line with the recommended changes above, we suggest changing M2 to; Generator Operators shall operate the generators to help minimize excursions outside the established tolerance bands for the agreed-upon metering point. It is recognized that excursions may occur outside of the tolerance bands during unit start-up and shut-down, during MW and MVAR loading at a transmission bus where multiple units are connected, during time of relatively sudden transmission system loading changes, during system events and when grid conditions are beyond the capability of a generator to correct. Therefore, when the system bus voltage is out of the tolerance band, the Generator Operator will not be held in non-compliance with this requirement if the sub-requirements 2.1, 2.2, and 2.3 are met. In order to identify when a unit is deviating from its schedule, GOPs will monitor voltage at the agreed upon metering point to which the GOP has access. Therefore, GOPs have the option to operate on a voltage schedule on either the high-side or convert the high-side schedule to a low-side schedule at the GOP's discretion. For units that monitor on the low-side/terminal voltage, Generator Operators shall provide evidence of the method of conversion from the high-side schedule to low-side monitoring. GOP shall have evidence to show compliance with requirement R2 by providing 1) Communications with the TOP when the Generator Operator was operating outside of the prescribed voltage or Reactive Power schedule tolerance band for __ minutes AND Generator Operator was unable to return the generator to operation within its voltage or Reactive Power schedule tolerance bands; 2) Generator Operator implemented an alternative method to control reactive output when the AVR was out-of-service or unavailable; 3) compliance with directive to modify voltage or a notification that the directive could not be met. Evidence may include, but is not limited to Generator Operator logs, SCADA data, phone logs, and any other alarming notifications that would alert the Transmission Operator that both conditions were met. Timing for Requirement R2.1 can be crucial during system events, and Generator Operators are expected to begin timing when notified of an event by the TOP as soon as the unit is operating outside of the tolerance band. Further, voltage documentation during a system event may be requested by an auditor to show measures were taken to bring the unit back into schedule. 5. To harmonize Footnote 4 with our recommended language for R2, we suggest Footnote 4 be revised to state; For the operations horizon, the GOP may choose a test-based or real-time method of establishing a unit's reactive power capability. The test-based capability is that determined for compliance with MOD-025. Parameters typically monitored for determining real-time capability may include 1) generator loading (MW, MVAR, amps), temperatures, and terminal voltage; 2) GSU loading and temperatures; 3) auxiliary bus voltages; 4) plant auxiliary equipment loadings, temperatures, and voltages; 5) Generator and GSU Volts/Hz limits; 6) excitation system and/or AVR limits. 6. If R2.1 sticks, we would like to see M2 clearly state that "if the GOP can return to schedule, he does not have to notify the TOP." 7. For the new footnote 6 referenced above; The TOP is to establish an official-for-compliance bus and phase voltage point for monitoring compliance of generators controlling to the high-side voltage. An excursion begins for compliance purposes when the measured voltage exceeds the bandwidth boundary by a recognizable amount (0.5%). Multiple notifications to the TOP need not be made when the system voltage wanders back and forth across the bandwidth boundary. The system voltage must be back within the boundary for one hour before the next excursion counts as a separate event. 8. VAR-002, R2.2 should read, "When a generator's automatic voltage regulator is out-of-service, the Generator Operator shall use an alternative method to control the generator reactive output to meet the voltage or Reactive Power schedule directed by the Transmission Operator, unless the TOP grants an exemption." The purpose of this change is to reference the process established in R3 of VAR-001. 9. VAR-002, R4 should be revised to state; "For

generator step-up and auxiliary transformers with nominal primary voltages equal to the generator terminal voltage:" This is to clarify that R4 is N/A to startup transformers and other station auxiliary transformers connected to a HV bus at a plant. 10. VAR-002, R5 should read, "after consultation with the Transmission Operator and agreement on schedule regarding necessary step-up transformer tap changes…'" for the reason stated under comment 3 above. Regarding the Technical Whitepaper; 1. The statement on p.7 that, "the more VARs produced at a generating facility, the fewer MWs produced," would be true only if operating to the generator OEM D-curve limit, and many generation units are instead typically limited by generator voltage limits due to variations in aux bus voltages. Under the latter situation raising and lower reactive power export or import does not affect the MW capability. 2. The statement on p.7 that "the informal development group did not want to place numerical requirements on what the proper operational limits should be for the continent," fails to consider that there are present-day abuses of the system that should be addressed in the VAR-001 update. Self-policing isn't working, hence our comment #1 above. 3. Ref. "unit drifts out of schedule," on p.9 it is the system that is drifting, not generation units. 4. The statement on p.10, "This industry divide is not addressed in the pro forma standard presented today," appears to account for some of the ambiguity discussed in the NAGF's comments. We believe that requirements need to be unambiguous, however, and there must also exist explicit and achievable means of achieving compliance. 5. While there is a sentence in the measure that states it is clearly the generator's discretion as to whether they monitor (presumably control) low side or high side to demonstrate compliance, we believe that there is still a substantial amount of language in the Standard and the Whitepaper that would tend to cloud that by implying that a generator should monitor high side for compliance if you have high side equipment installed; in other words, the monitoring/control point is based on current installed equipment. 6. Additionally, the Whitepaper does nothing to shed light on whether generators should make manual moves to reactive output (by changing the AVR low side set-point) without explicit direction form the TOP which leaves the compliance application open for interpretation.

Yes

1. In order 693 Page 488 the FERC "directive" for VAR-002 stated, "Dynegy has suggested an improvement to Reliability Standard VAR-002-1, and NERC should consider this in its Reliability Standards development process." Dynegy's concern stated, "VAR-002-1 should be modified to require more detailed and definitive requirements when defining the time frame associated with an 'incident' of non compliance." Dynegy offered two alternatives to address their concern: "…[1] either more detail should be added to the Reliability Standard to cure this omission, Or [2] the Reliability Standard should require the transmission operator to have a technical basis for setting the time frame that takes into account system needs and any limitations of the generator." Their reasoning: "… this approach will eliminate the potential for undue discrimination and the imposition of overly conservative or excessively wide time frame requirements, both of which could be detrimental to grid reliability." Note that voltage tolerance band is not mentioned. 2. Going from NERC "should consider" Dynegy's suggested improvements to a very prescriptive time requirement (embedded in a VSL) in the current version of VAR-002 was a big step from the generation perspective. Also, it appears that Dynegy's second alternative was ignored during this step. 3. In the 2013 FERC Order approving VAR-002-2b (current version which became effective on July 1, 2013): PPL presented valid arguments against the "zero tolerance" time frame deviation introduced in the VSLs from the generator operator perspective (see Paragraphs 15 and 16). Both NERC and FERC rejected PPL's arguments. Paragraph 17 states, "NERC argues that the proposed modification would allow for a deviation in system voltage for up to 30 minutes to allow for time to correct an excursion and that such deviations from a voltage and reactive schedule is inappropriate because a deviation even up to a few minutes can negatively impact reliability." Paragraph 18 goes on to say, "NERC maintains that significant voltage deviations for extended periods of time may lead to voltage collapse and can increase the potential for a wide-area impact to the reliability of the Bulk-Power System, and as such PPL Companies' proposed modification to the VSL language should be rejected." The context of the NERC and FERC discussions and agreement on the rigid time requirement apparently assumes all TOP's voltage schedule tolerance bands are reasonable and "reliability based". Also, there seems to be an absence of discussion on Dynegy's 2nd alternative for the "the transmission operator to have a technical basis for setting the time frame that takes into account system needs and any limitations of the generator." However, the Pro Forma VAR R1 will require each TOP to have documented policies or procedures used to "establish, monitor, and controls voltage levels and Reactive Power flows within limits as defined below: R1.1 These documented policies or procedures shall include criteria used in system

assessments. The criteria for the assessments shall include established steady-state limits, voltage stability limits and associated operating margins, and voltage schedules along with associated tolerance bands." Thus, a fair question on the Pro Forma standards follows: If VAR-001 R1.1 is met, can GOPs conclude that each TOP's tolerance bands have a documented technical basis? If not, what mechanism will allow GOPs to question extremely narrow voltage or reactive power schedule tolerance bands that make compliance with VAR-002 R2.1 difficult or impossible? Note the Background discussions in the White Paper (see Pages 7 – 10). The discussion for VAR-001 R4 states, "The informal development group is cognizant of the fact that the nature of reactive power on the network varies depending on local conditions. Thus, the group focused on the process that the requirements would detail, not the proper numbers a TOP should enforce in the standard. For VAR-001, the group would not put operational limits on how a TOP should manage voltage stability for its regions; more specifically, the informal development group did not want to place numerical requirements on what the proper operational limits should be for the continent. Operating margins vary due to specific system characteristics as well as the operating conditions." This begs the question: Why was this same rationale not applied in addressing the time frame? 4. The published reasons for the changes to VAR-002 include 1) eliminating nuisance calls and mitigating compliance issues for generators (i.e. non-reliability gap reducing violations), and 2) addressing the FERC directive to NERC to "consider a timeframe" for allowing a generator to be out of schedule before having to make a notification to its TOP. It could be argued that imposition of a very prescriptive time frame alone does not fully address the FERC "directive" language and the first Pro Forma objective of reducing nuisance calls (GOP to TOP), especially if the voltage tolerance bands are extremely tight or do not have a technical basis.
Individual
Texas Reliability Entity
Texas Reliability Entity
Yes
VAR-001----R1 is too vague and general and nature. It does not establish a time period for compliance, and it does not provide sufficient criteria to allow an entity or an auditor to determine whether the "policies and procedures" are effective and adequate to satisfy the standard.
Yes
***VAR-001---- (1) R2.2 refers to "day-ahead voltage limits identified in Requirement R1," but R1 does not have a timeframe associated with it, and it does not expressly require identification of "day-ahead voltage limits." (2) The Measures include many details that appear to be intended to flesh out the requirements, not just to explain what will be expected to demonstrate compliance with the requirements. For example, most of M3 deals with "temporary exemptions," but there is no mention of "temporary exemptions" in R3. (3) In R4, is the specified voltage and tolerance band at the GSU or at the interconnection point (which in many cases is not the GSU)? In a world with long lead lines, setting a definite unique location for a voltage point and associated tolerance is required. ***VAR-002---- (1) Actions necessary to maintain a voltage or Reactive Power schedule are needed to prevent drift. As written the GOP would only have to be within its voltage or Reactive Power schedule for 2 minutes of a given hour and never notify its TOP. Is that what is intended? (2) Measure M2 contains an enormous amount of information that appears intended to modify the requirement – that is not the purpose of a measure. The requirement should be written to capture all of the elements of and exceptions to the requirement. (3) R3 ignores the requirement for the TOP in VAR-001-4 to know the status of "all transmission Reactive Power resources, automatic voltage regulators, and power system stabilizers in their system" as defined in VAR-001-4 R5. (4) In R5, there is a disconnect between actions by a GO in R5 and actions by a GOP in R5.1. (5) The VSL for R2 should be reconsidered. This does not appear to be a binary requirement, as multiple levels of non-compliance could be identified. Also, does the VSL require ALL sub-requirements to not be met before a non-compliance occurs—the language used is ambiguous. (6) The VSL for R4 does not correspond to the language of R4 (R4-data within 30 days of a request---VSL talks about timeframes of not meeting a schedule). (7) The VSL for R5 fails to recognize the role of a GO as stated in the requirement.
Yes
As written the GOP would only have to be within its voltage or Reactive Power schedule for 2 minutes

of a given hour and never notify its TOP. Is that what is intended?
Group
Western Electricity Coordinating Council
Steve Rueckert
Yes
WECC notes that Requirement R3.2 has been deleted from the proposed standard. The proposed R3 in VAR-002-3 still requires the GOP to notify its associated TOP of a status or capbility change on any generator Reactive Power resource, including the status of each automatic voltage regulator and power system stabilizer (old R3.1) but the requirement for the GOP to notify its associated TOP of a status or capbility change on any other Reactive Power resource under the GOP's control (old R3.2) is no longer included in the proposed VAR-002-3. What is the purpose of removing this requirement?
No
Individual
Richard Vine
California Independent System Operator
Agree
IRC/Standards Review Committee
Individual
David Wang
SDG&E
San Diego Gas and Electric
No
Yes
R.1. This requirement is very unclear and the objective is undefined for the Transmission Operator in establishing the criteria for the system assessments that are to be included in the required policy. TOPs establish their operating limits (SOLs and IROLs) based on NERC and WECC RC (in the west) criteria. Would this established criteria (in the west) be the intended 'criteria' that should be used in a TOP's system assessment in the WECC region for this requirement or are there other minimum criteria that are expected to be included to meet compliance with this requirement? When establishing these operating limits, voltage and reactive requirements are captured when the WECC RC criteria is applied as required as part of the compliance with FAC-014-2 R2 for TOP entities in the WECC region. Does the establishment of this requirement create an unintended duplication of the reliability standards? These studies follow a specific methodology and criteria established and used, but requirement 1.1 refers to a criteria that is not entirely clear on what the TOP should be using.
No
Group
Southern Company: Southern Company Services, Inc.; Alabama Power Company; Georgia Power Company; Gulf Power Company; Mississippi Power Company; Southern Company Generation; Southern Company Generation and Energy Marketing
Pamela Hunter
No

Yes
On VAR-001 and VAR-002 regarding voltage schedule and compliance: The published reasons for the changes to these standards are 1) to eliminate nuisance calls and non-reliability gap reducing violations, and 2) to address the FERC directive to NERC to "consider a timeframe" for allowing a generator to be out of schedule before having to make a notification to its TOP. The changes to the standards do not fully address the first objective of reducing nuisance calls (GOP to TOP) regarding being off schedule. In addition, we have considered the idea of notification timeframes and do not suggest including such GOP notifications in the revised VAR-002. Currently, GOPs are required to maintain generator voltage or Reactive Power Schedules as directed by the TOP. If the GOP experiences problems maintaining voltage schedules, the TOPs, if warranted, will notify the GOP to either maintain or modify their voltage schedule as needed to maintain reliability of the TOP area. This existing construct has proved to work well and a new notification requirement is unnecessary. VAR-001-4 R1 Comments: Regarding R1 Part 1.1, the language addressing the specification for the criteria for the assessments needs refining. Regarding the verbiage specifying the inclusion of “estabilished steady-state limits”, while one would assume that means voltage level steady state limits, this needs to be clarified. Otherwise, it could be mis-interpreted to include steady state Mvar flows or other power system quantities. Also, the inclusion of voltage stability limits and operating margins is not applicable to all TOP footprints. Voltage stability limits manifests as the potential limiting phenomena in systems with high transfers or dense loads served over high nominal voltage kV transmission lines. Transmissions systems that are predominately load serving by local generation over lower nominal kV transmission lines are often shown, through off-line studies, to be limited by thermal and/or voltage level limits far in advance of voltage stability limits. Given that voltage stability analysis is not trival, this verbiage is burdensome and would require subject matter expertise that is not widely available for no reliability gain. Would suggest chaning the verbiage to “…..for systems where voltage stability limits are potentially the limiting phenomiena, the criteria for the assessment should also inlcude voltage stability limits and associated …….” Finally, need to include that voltage stability limits can be identified in off-line studies. VAR-001-4 R2 Comments: Modify R2 from…..”….are available for scheduling to maintain voltage stability under normal and contingency conditions conditions in order to provide the voltage levels as defined in Requirement R1” to ….”….are available to provide the voltage levels as defined in Requirement R1”. If the voltage limits found in R1 are honored, inheritently, any voltage stability limit will also be honored. Note for voltage stability limits associated with high transfer over EHV corridors, the corresponding pre-contingency voltage level limit may be near levels which are normally considered acceptable. In addition, VAR-001-4 R2 is redundant with several existing and future enforceable standards: TOP Requirements TOP-002 R10 and R11 & TOP-003 R1 and 2: The proposed VAR-001-4 R2 is redundant with the existing TOP-002 Requirements 10 and 11 that require operational assessments so that TOPs can plan to meet all SOLs and IROLs which include voltage limits. TOP-002 R10 and R11 will be replaced with TOP-003 Requirements 1 and 2 when the “Real Time Operations” project is approved by FERC. TOP-003 R1 and R2 require operational assessments to be able to operate within SOLs and IROLs as well. TOP-004-2 R6: VAR-001-4 R2 is also redundant with TOP-004-2 R6. The Real Time Operations SDT recognized that TOP-004-2 R6 was covered by TOP-001-2 which requires TOPs to operate within SOLs and IROLs. TOPs must perform assessments to be able to operate within such limits; therefore, the proposed VAR-001-4 R2 is redundant with TOP-004-2 R6 and TOP-001-2 when approved by FERC. RC Requirements FAC-011-2: The purpose of FAC-011-2 states, “To ensure that System Operating Limits (SOLs) used in the reliable operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.” Since this requires documented methodology for SOLs, which includes voltage and stability limits, VAR-001-4 R2 is redundant with FAC-011-2. FAC-014-2: The purpose of FAC-014-2 states, “To ensure that System Operating Limits (SOLs) used in the reliable planning and operation of the Bulk Electric System (BES) are determined based on an established methodology or methodologies.” Since this standard requires establishment of SOLs and IROLs, which include voltage and stability limits, VAR-001-4 R2 is redundant with FAC-014-2. IRO-008-1 R1: VAR-001-4 R2 is also redundant with IRO-008-1 R1 that requires RCs to perform assessments to ensure they do not exceed IROLs. IRO-005-3a : The proposed VAR-001-4 R2 is redundant with the existing IRO-005-3a R1 and its sub-requiremetns. It has been proposed to retire IRO-005-3a R1 and its sub-requirements with the SDTs rationale of “monitoring capability can be objectively measured and is essential to real-time operations – however real-time monitoring is a supporting activity and is only one of several processes used to support operation within defined parameters. Monitoring capability should be assessed during certification of an RC and not as a

requirement. " Given the IRO-005 SDT's rationale, the fact that the NERC BOT approved IRO-005-4, and the fact that assessments are already required in other existing Reliability Standards, VAR-001-4 R2 should be deleted. VAR-001-4 R4: The statement, "Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band (at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion) at the interconnection point between the generator facility and the Transmission Owner's facilities has a semantics glitch in that there is just one interconnect point. That is, mandating control at the interconnection eliminates any discretion in making the high vs. low-side selection. We suggest saying instead, "Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band, at the agreed upon metering point to which the GOP has access." This will typically be either the transmission bus or the generator terminals. If the TOP specifies this as the TO's "transmission bus", the TO should be required to make the same voltage point used by the TOP available to the GOP to ensure both are seeing the exact same voltage. VAR-001-4 R5 is redundant with the existing TOP-006-2 (R1 and R2), which states the following, and with the proposed TOP-003-2 that requires TOPs to specify and entities to provide data necessary for it to perform its required Operational Planning Analyses and Real-time monitoring. R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use. R1.1. Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use. R1.2. Each Transmission Operator and Balancing Authority shall inform the Reliability Coordinator and other affected Balancing Authorities and Transmission Operators of all generation and transmission resources available for use. R2. Each Reliability Coordinator, Transmission Operator, and Balancing Authority shall monitor applicable transmission line status, real and reactive power flows, voltage, load-tap-changer settings, and status of rotating and static reactive resources. VAR-001-4 R5 is redundant with the existing TOP-006-2 R5 because it also requires TOPs to know the status of resources to bring to the attention of operating personnel important deviations in operating conditions and to indicate, if appropriate, the need for corrective action. The Real Time Operations SDT proposed to delete this requirement as it should be covered in the certification process for RCs, TOPs, and BAs. The SDT also noted that this requirement was covered by over enforceable reliability standards (BAL-005, TOP-001, and IRO-008); thus the proposed VAR-001-4 R5 is redundant and should be deleted. In addition, the reactive resources are the generator and not the ancillary resources such as AVR and PSS. VAR-001 R6: Generators should be allowed to make these changes during a scheduled unit downtime as long as the time is within a reasonable period of time. We suggest the time be within 12 months and propose the following rewording fo this requirement: "After consultation with the Generator Owner regarding necessary step-up transformer tap changes, the Transmission Operator shall provide documentation to the Generator Owner specifying the required tap changes, a timeframe for making the changes that is mutually agreed and no longer than 12 months, and technical justification for these changes." On VAR-002, R2: We recommend eliminating "Facility Ratings" in R2 and in the footnote of VAR-002 R2 footnote 4. Use of the NERC-defined term "Facility Ratings" presents a problem, because only occasionally do equipment ratings define the amount of reactive power that a generating unit can import or export. We suggest using the term "unit capabilities" in lieu of the term "Facility Ratings." The clarification in footnote 4, "When a Generator is operating in manual control, reactive power capability may change based on stability considerations and this may lead to a change in the associated Facility Ratings," only further confuses the issue. R2 should read, "Unless exempted by the Transmission Operator, each Generator Operator shall maintain the generator voltage or Reactive Power schedule (within each unit's capabilities) as directed by the Transmission Operator." Footnote 4 should be moved to R2.2 and changed to "When a Generator is operating in manual control, reactive power capability may change based on stability considerations." On VAR-002, M2: a) remove "all" from "all attempts" and ; b) the documentation requirements listed in the measure are excessive and unreasonable and unduly burdensome. We recommend, alternatively (or in addition), a statement from the TOP is acceptable evidence of GOP compliance with R2 (the voltage support performance). On VAR-002, R4: This requirement should be revised to state; "For generator step-up and auxiliary transformers with nominal primary voltages equal to the generator terminal voltage:" This will clarify that R4 is N/A to startup transformers and other station auxiliary transformers connected to a HV bus at a plant. On VAR-002, R5 rational: We suggest modifying the rationale for R5, second sentence to read " If the tap setting is not properly set, then the VAR capability of a unit can be affected."

Yes

As previously stated in our response from Question #2: On VAR-001 and VAR-002 regarding voltage

schedule and compliance: The published reasons for the changes to these standards are 1) to eliminate nuisance calls and non-reliability gap reducing violations, and 2) to address the FERC directive to NERC to "consider a timeframe" for allowing a generator to be out of schedule before having to make a notification to its TOP. The changes to the standards do not fully address the first objective of reducing nuisance calls (GOP to TOP) regarding being off schedule. In addition, we have considered the idea of notification timeframes and do not suggest including such GOP notifications in the revised VAR-002. Currently, GOPs are required to maintain generator voltage or Reactive Power Schedules as directed by the TOP. If the GOP experiences problems maintaining voltage schedules, the TOPs, if warranted, will notify the GOP to either maintain or modify their voltage schedule as needed to maintain reliability of the TOP area. This existing construct has proved to work well and a new notification requirement is unnecessary.
We fully support the need for coordination between the TOP/GOP regarding the establishment of voltage schedules. We suggest that a joint tap coordination study be performed. VAR-002 R5 alludes to this need for coordination. This process should help identify any transmission system and generating unit limitations with respect to var limitations and voltage support.
Group
Western Area Power Administration
Lloyd A. Linke
Agree
US Bureau of Reclamation, except for requiring the drafting team from explaining why the WECC variation should be applied outside of WECC.
Individual
Alice Ireland
Xcel Energy
No
Yes
1) VAR-001-4, R1 -- Although a good results-based reliability requirement, there is significant overlap with FAC-014 with regards to establishing SOL and IROL. The FAC-14 requires TOP to establish steady-state and stability-limited SOLs in accordance to its RC SOL methodology. For example, in the WECC RC SOL methodology, the RC states criteria for steady-state limit, voltage stability, and operating margins (in accordance with FAC-011 requirements) which apply to each TOP. Having these criteria to be established again in VAR-001-4 creates an issue of “Double Jeopardy” with FAC-014 and FAC-011 since system assessment done for establishing SOLs is fundamentally no different than described in this R1. 2) VAR-001-4, R2 -- Although a good results-based reliability requirement, there is significant overlap with TOP-002 enforceable standard. The TOP-002 R11 that states “The Transmission Operator shall perform seasonal, next-day, and current-day Bulk Electric System studies to determine SOLs”. Here the definition of SOLs already includes the steady state limits, voltage stability limit. So again, this creates a “Double Jeopardy” issue. It may be argued that TOP-002-3 has been approved by NERC BOD (but not by FERC yet) which may eliminate this issue. But even in the new TOP-002-3, R1 states “Each Transmission Operator shall have an Operational Planning Analysis that represents projected System conditions that will allow it to assess whether the planned operations for the next day within its Transmission Operator Area will exceed any of its Facility Ratings or Stability Limits during anticipated normal and Contingency event conditions” So even in this situation, the TOP already needs to have operating planning analysis... which is no different than performing assessment. 3) VAR-001-4, R2 addresses assessments for scheduling purposes while R2.1 mostly addresses real-time operation of devices. This seems inappropriate and we recommend moving R2.1 out to its own requirement. We believe that this requirement should include the RC as well as the TOP. The RC is required to do the assessment for scheduling in R2, but is not required to take any action to actually schedule the generation like the TOP is required to under R2.2. For example In the MISO region, the RC has more direct control over the generation dispatch than its members so I believe that they should also be subject to responsibility in R2.2. 4) VAR-002-3, Recommend firming up the language, such as “A Generator Operator shall notify its associated Transmission Operator…”. Also a timeframe needs to be applied to the second requirement to not

allow a GOP an infinite amount of time to return its voltage to the schedule. The M2 measure suggests that the reason the generator can't return to its schedule is because of a limiting factor. If that is the intent of the requirement, it should be stated in the requirement and not the measure. Part of the M2 measures seems to contradict statements made in the VAR-001-4 standard. M2 of VAR-002-3 states that the GOP has the "option to operate on a voltage schedule on either the high-side or convert the high-side schedule to a low-side schedule at the GOP's discretion" while R4 of VAR-001-4 states "Each Transmission Operator shall specify a voltage or Reactive Power schedule and tolerance band (at either the high side or low side of the Generator Step-Up transformer at the TOP's discretion)". This is confusing at best and contradictory at worse. Language in both standards should be cleaned up to clearly identify who has authority to determine where a voltage schedule is defined. 5) VAR-002-3, R2.1: Some vertically integrated utilities may have voltage monitoring systems managed by the TOP. In this case the notification would be done by the TOP to the GOP and the corrective actions jointly developed. Therefore, we suggest rewording R2.1 to something like this: [2.1. If a generating unit drifts out of the prescribed voltage or Reactive Power Schedule3 (within applicable Facility Ratings4) tolerance bands, the GOP and TOP shall have a process established to return the generator to the schedule or an acceptable alternative within 30 minutes.]
Individual
Roger Dufresne
Hydro-Québec Production
No
No
No
VAR-002-3 Regarding Measure M2, M2 presents the scenarios where a Generator Operator may not be able to meet a voltage schedule or comply with the TOP's directive, and how a GOP may manage the situations. The description part does not belong in a Measure, and should be moved to the Background Information Section that a Results-based standard template has made provision for. Regarding Measure M3, the latter part of M3 is not presented in a manner to require the evidence to demonstrate compliance. Suggest revising M3 to read: The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any of the changes identified in Requirement 3, or evidence that the status had been restored within the first 15 minutes of such change. For all Measures, there are no examples of evidence provided. It would be appropriate if after each of the "evidence", additional wording "such as log, recording, or other documents" so as to be consistent with the way Measures are presented in other standards. Regarding Evidence Retention, it would be appropriate to reference the Measure Number for the GO's and the GOP's data retention requirements
Group
Electric Power Supply Association
Jack Cashin
Yes
EPSA believes that simultaneous processing of the SAR and the standard, as was done in this instance puts them at cross-purpose with one another. This risks a situation where if a SAR needs changes, stakeholder comments on standard will be based on a defective SAR that needs work and becomes an inefficient use of stakeholder resources. The SAR scope for proposed VAR-002-2 has not considered all the aspects that can ensure that the Standard will reach a steady state. Since its issuance in June of 2013, NERC and Stakeholders have recognized that the "Standards Independent Experts Review Project" provides a global assessment of Standards including VAR-002-2. The Independent Experts recommend that requirements that are part of VAR-002-2 are duplicative and covered under other

standards or covered by tariff requirements. To avoid duplication or conflating reliability and market issues the SAR scope would benefit from including the recommendations of the Independent Experts in the current VAR-002-2 project. This will avoid expending resources on the Independent Experts recommendations in the future.
No
No
Individual
Russ Schneider
Flathead Electric Cooperative
Yes
Overall, the implementaiton of this requirement seems paperwork heavy for Transmission Operators and seems to single out generators in the western interconnection.