

Meeting Notes

Project 2016-EPR-02

October 25-27, 2016

NERC Headquarters
Atlanta, GA

Administrative

1. Introductions

The meeting was brought to order by the Chair, S. Solis at 8:30 a.m. Eastern, Tuesday, October 25, 2016. S. Solis provided the team with general comment. Guests introduced themselves to the group. S. Barfield-McGinnis communicated housekeeping items and provided a safety briefing. Participants were introduced and those in attendance were:

Name	Company	Member/ Observer	In-person (Y/N)	Conference Call/Web (Y/N)
Stephen Solis	Electric Reliability Council of Texas, Inc. (ERCOT)	Chair	Y	-
Dennis Sauriol	American Electric Power (AEP)	Vice Chair	Y	-
Alex Chua	Pacific Gas & Electric (PG&E)	Member	-	-
Kevin Harrison	ITC Holdings	Member	Y	-
Bill Harm	PJM Interconnection, LLC	Member	-	-
Tim Kucey	PSEG Fossil, LLC	Member	Y	-
Michael Scott	NextEra Energy, Inc.	Member	Y	-
Laura Anderson	North American Electric Reliability Corporation	NERC Staff	Y	-
Scott Barfield- McGinnis	North American Electric Reliability Corporation	NERC Staff	Y	-

Name	Company	Member/ Observer	In-person (Y/N)	Conference Call/Web (Y/N)
Soo Jin Kim	North American Electric Reliability Corporation	NERC Staff	Y	-
Lauren Perotti	North American Electric Reliability Corporation	NERC Staff	-	Y
Juan Villar	Federal Energy Regulatory Commission (FERC)	Observer	Y	-
Juan Luz	Federal Energy Regulatory Commission (FERC)	Observer	Y	-
Michael Cruz-Montes	CenterPoint Energy, LLC	Observer	Y	-
Robert Hirschak	CLECO	Observer	-	Y
Andy Pusztai	American Transmission Corporation, LLC	Observer	-	Y
Guy Zito	Northeastern Power Coordinating Council (NPCC)	Observer	Y	-

2. Determination of Quorum

The rule for NERC Standard Drafting Team (SDT or team) states that a quorum requires two-thirds of the voting members of the SDT. Quorum was achieved as five of the seven members were present each day.

3. NERC Antitrust Compliance Guidelines and Public Announcement

NERC Antitrust Compliance Guidelines and public announcement were read by S. Barfield-McGinnis. The group was reminded at the beginning of each day that participants are under the guidelines. There were no questions.

4. Roster Updates

The team reviewed the team roster and confirmed that it was accurate and up to date.

Agenda

1. Standing Review Team

G. Zito provided guidance on the enhanced periodic review. Emphasis was placed on focusing on whether the standards have issues pertaining to any gap in reliability, paragraph 81 requirements, and problems with Violations Severity Levels or Violations Risk Factors. Other factors include the potential cost effectiveness of a standard or whether there is a need for a requirement that could be a reliability guideline or whitepaper. G. Zito noted that the NPCC region did not have any issues from the compliance standpoint. S. Solis noted that he sees that other standards (e.g., TOP-001-1, Requirement R8) that have yet to be fully implemented could result in potential gaps or overlap.

S. Solis noted a concern stemming from the work that a previous team working on the Transmission Operations (TOP) and Interconnection Reliability Operations (IRO) standards regarding a retired requirement that specifically addressed dynamic reserves. The TOP/IRO team mapped or pointed to the VAR standards as achieving the intent of the TOP/IRO standards. A second look is needed.

Project 2014-03 – TOP/IRO project to see how the requirements were mapped from the original Transmission Operations (TOP) and Interconnection Reliability Operations (IRO) standards. The following outlines the loss of “required reactive reserves:”

The Project 2007-03 mapping document¹ explained that TOP-001-1a Requirement R8² was replaced by the approved VAR-001-1, Requirement R8:³

“First sentence – Reactive Power:

Replaced by Approved VAR-001-1, Requirement R8 for the Transmission Operator, which covers Reactive Power requirements and the meaning of balancing Reactive Power for the Transmission Operator. The Balancing Authority must be told by the Transmission Operator to take actions regarding Reactive Power per the NERC Functional Model V5 (see proposed TOP-001-2, Requirement R1) and, therefore, the Balancing Authority can be deleted from this part of the requirement.

Second sentence –

¹ Mapping Document for Project 2007-03, page 6, http://www.nerc.com/pa/Stand/Project%20200703%20Realtime%20Transmission%20Operations%20DL/rtosdt_seventh_posting_mapping_document_20120214_clean.pdf

² TOP-001-1, **R8**. During a system emergency, the Balancing Authority and Transmission Operator shall immediately take action to restore the Real and Reactive Power Balance. If the Balancing Authority or Transmission Operator is unable to restore Real and Reactive Power Balance, it shall request emergency assistance from the Reliability Coordinator. If corrective action or emergency assistance is not adequate to mitigate the Real and Reactive Power Balance, then the Reliability Coordinator, Balancing Authority, and Transmission Operator shall implement firm load shedding.

³ VAR-001-1, **R8**. Each Transmission Operator shall operate or direct the operation of capacitive and inductive reactive resources within its area – including reactive generation scheduling; transmission line and reactive resource switching; and, if necessary, load shedding – to maintain system and Interconnection voltages within established limits.

The Balancing Authority must be told by the Transmission Operator to take actions regarding Reactive Power (see proposed TOP-001-2, Requirement R1) and, thus, the Balancing Authority is not necessary.

Replaced by approved VAR-001-1, Requirements R1, R8, and R12 for the Transmission Operator.

Third sentence –

VAR-001-1 R1. Each Transmission Operator, individually and jointly with other Transmission Operators, shall ensure that formal policies and procedures are developed, maintained, and implemented for monitoring and controlling voltage levels and Mvar flows within their individual areas and with the areas of neighboring Transmission Operators.

VAR-001-1, R8. Each Transmission Operator shall operate or direct the operation of capacitive and inductive reactive resources within its area – including reactive generation scheduling; transmission line and reactive resource switching; and, if necessary, Load shedding – to maintain System and Interconnection voltages within established limits.

VAR-001-1, R12. The Transmission Operator shall direct corrective action, including Load reduction necessary to prevent voltage collapse when reactive resources are insufficient.”

Note that TOP version 2 was withdrawn due to the likelihood of a remand and version 3 was developed under Project 2014-03.

Under the Project 2014-03 mapping document,⁴ VAR-001-1, Requirement R8 was moved to VAR-001-4, Requirement R3:⁵

“First sentence – reactive power: Replaced by approved VAR-001-4, Requirement R3 for the Transmission Operator which covers reactive power requirements and the meaning of balancing reactive power for the Transmission Operator. The Balancing Authority must be told by the Transmission Operator to take actions regarding reactive power per the NERC Functional Model V5 and therefore the Balancing Authority can be deleted from this part of the requirement.

Second sentence – The Balancing Authority must be told by the Transmission Operator to take actions regarding reactive power and thus the Balancing Authority is not necessary. Replaced by approved VAR-001-4, Requirements R1 for the Transmission Operator.

⁴ Mapping Document Project 2014-03, December 2014, page 33, http://www.nerc.com/pa/Stand/Prict201403RvsnstoTOPandIROStndrds/2014_03_fifth_posting_mapping_document_20141223.pdf.

⁵ VAR-001-4, **R3**. Each Transmission Operator shall operate or direct the Real-time operation of devices to regulate transmission voltage and reactive flow as necessary.

Third sentence – Replaced by approved IRO-009-1, Requirements R1 and R2 for the Reliability Coordinator. Replaced by approved EOP-003-2, Requirement R1 for the Transmission Operator and Balancing Authority.

Approved VAR-001-4, Requirement R1:

R1. Each Transmission Operator shall specify a system voltage schedule (which is either a range or a target value with an associated tolerance band) as part of its plan to operate within System Operating Limits and Interconnection Reliability Operating Limits.

Approved VAR-001-4, Requirement R3:

R3. Each Transmission Operator shall operate or direct the Real-time operation of devices to regulate transmission voltage and reactive flow as necessary.”

J. Villar emphasized comments from the previous meeting at PJM that the FERC technical staff did not have any particular issue with the Voltage and Reactive (VAR) standards. Both standards in the last approvals were approved by letter order, which is representative of high approval and acceptance.

2. Review of Notes from Previous Meetings

The SDT conducted a review of the September 7-9, 2016 meeting notes. The team was satisfied with the content of the notes.

3. Review of VAR Reliability Standards

- a. MRO-SAR – The team reviewed the SAR with Joseph Knight (author) joining the team meeting. S. Solis commented that removing the requirement (i.e., VAR-001-4.1, R3) could potentially create a gap. For example, TOP-001-4, Requirement R1 requires the Transmission Operator to “maintain reliability” and is very broad. One could argue it is redundant to many other reliability requirements. Lastly, TOP/IRO projects 2007-03 and 2014-03 retired TOP-001-1, Requirement R8⁶ that was mapped to the VAR-001-4, Requirement R3 as being addressed. J. Knight noted that the SAR was also a test of feedback loop as described in the SAR. Also, A. Pusztai noted that it was possible that the MRO compliance team put forth the SAR not having the full information of the TOP/IRO body of work. T. Kucey asked if there is a way to acknowledge that MRO’s feedback loop process worked. The team addressed the concern and provided their subject matter expert opinion of the SAR that VAR-001-4.1, Requirement R3 (unchanged from VAR-001-4) should remain in the standard. S. Barfield-McGinnis will be taking the team’s recommendation on the SAR back to NERC staff. He also recommended to A. Pusztai and J. Knight to request MRO withdraw the SAR rather than taking it forward to the Standards Committee. NERC will also facilitate a conversation with MRO to determine how to

⁶ TOP-001-1, **R8**. During a system emergency, the Balancing Authority and Transmission Operator shall immediately take action to restore the Real and Reactive Power Balance. If the Balancing Authority or Transmission Operator is unable to restore Real and Reactive Power Balance, it shall request emergency assistance from the Reliability Coordinator. If corrective action or emergency assistance is not adequate to mitigate the Real and Reactive Power Balance, then the Reliability Coordinator, Balancing Authority, and Transmission Operator shall implement firm load shedding.

the feedback loop should be socialized within the MRO region and across the ERO stakeholders.

- b. Review and ranking of VAR-001-4.1 and VAR-002-4 parking lot observations (see attached Exhibit A).

Additional comments not in Exhibit A. The team discussed VAR-002-4, Requirement R2, Part 2.2 (“When instructed to modify voltage, the Generator Operator shall comply or provide an explanation of why the schedule cannot be met.”). The issues was whether it is duplicative of TOP-001-3 (i.e., to be effective April 1, 2017), Requirements R3 (“*Each Balancing Authority, Generator Operator, and Distribution Provider shall comply with each Operating Instruction issued by its Transmission Operator(s), unless such action cannot be physically implemented or it would violate safety, equipment, regulatory, or statutory requirements*”) and R4 (“*Each Balancing Authority, Generator Operator, and Distribution Provider shall inform its Transmission Operator of its inability to comply with an Operating Instruction issued by its Transmission Operator*”). T. Kucey expressed that his organization would prefer Part 2.2 to remain as a benefit to GOP staff of its importance. J. Villar noted that he believed FERC technical staff would support leaving Part 2.2 as is and not considering it for retirement due to TOP-001-3.

The team discussed VAR-002-4, Requirement R3 concerning the Generator Operator notifying its associated Transmission Operator of a status change on the AVR, power system stabilizer, or alternative voltage controlling device within 30 minutes of the change. It was thought that this requirement could be a P81 candidate based on potential redundancy with IRO-010-2 and TOP-003-3 (to be effective April 1, 2017). T. Kucey was concerned that if the requirement was retired it could lead to applicable entities to ask for data on varying intervals (e.g., instantaneously, every 5 minutes, etc.). The current requirement allows that if the status has been restored within 30 minutes of such change, then the Generator Operator is not required to notify the Transmission Operator of the status change. The team agreed that this is not a candidate for retirement.

Other: PSEG recommended the following for VAR-001-4.1, Requirement R5.1: The Transmission Operator shall provide (in writing) the voltage or Reactive Power schedule (which is either a range or a target value with an associated tolerance band) to the associated Generator Operator and direct (instruct) the Generator Operator to comply with the schedule in automatic voltage control mode (the AVR is in service and controlling voltage). EPRT Response: "In writing" may not be technology neutral and too restrictive. The definition of "direct" is to "instruct;" however, the team was amenable to recommending to replace "direct" with "instruct."

The team decided to have S. Barfield-McGinnis reach out to the Western Electricity Coordinating Council (WECC) concerning the regional variance in VAR-001-4.1 and the two Regional Reliability Standards, VAR-002-WECC-2 and VAR-501-WECC-2. Furthermore, the chair,

vice-chair, standards developer, and the team WECC member will meet to the extent possible with various WECC stakeholders as a “sub-committee” to evaluate the variance and two regional standards, then report back to the full team at a later date.

G. Zito noted that the team should be clear and articulate what is broken with the standard, if anything, and provide a thorough narrative on their findings. The focus should be on the “red” items and “yellow” items as other issues that should be considered by a future drafting team.

S. Solis raised asked where the issue of reactive reserves should be addressed in the team’s parking lot items. S. Barfield-McGinnis recommended pairing it with the closest Requirement in VAR-001. The issue stems from language being removed from IRO-005-3.1a concerning reactive reserves. The following is from the mapping document associated with Project 2014-03:

Standard IRO-005-3.1a — Reliability Coordination - Current Day Operations	
Requirement in Approved Standard	Proposed Language in New Standard or Comment
<p>R1. Each Reliability Coordinator shall monitor its Reliability Coordinator Area parameters, including but not limited to the following:</p> <p>R1.1. Current status of Bulk Electric System elements (transmission or generation including critical auxiliaries such as Automatic Voltage Regulators and Special Protection Systems) and system loading.</p> <p>R1.2. Current pre-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan’s viability and scope.</p> <p>R1.3. Current post-contingency element conditions (voltage, thermal, or stability), including any applicable mitigation plans to alleviate SOL or IROL violations, including the plan’s viability and scope.</p> <p>R1.4. System real and reactive reserves (actual versus required).</p> <p>R1.5. Capacity and energy adequacy conditions.</p> <p>R1.6. Current ACE for all its Balancing Authorities.</p> <p>R1.7. Current local or Transmission Loading Relief procedures in effect.</p> <p>R1.8. Planned generation dispatches.</p> <p>R1.9. Planned transmission or generation outages.</p> <p>R1.10. Contingency events.</p>	<p>Replaced by proposed IRO-002-4, Requirements R3 and R4.</p> <p>Proposed IRO-002-4, Requirement R3: R3. Each Reliability Coordinator shall monitor Facilities, the status of Special Protection Systems, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.</p> <p>Proposed IRO-002-4, Requirement R4: R4. Each Reliability Coordinator shall have monitoring systems that provide information utilized by the Reliability Coordinator’s operating personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized information systems, over a redundant infrastructure.</p>
<p>R2. Each Reliability Coordinator shall monitor its Balancing Authorities’ parameters to ensure that the required amount of operating reserves is provided and available as required to meet the Control Performance Standard (CPS) and</p>	<p>The first sentence is replaced by proposed IRO-002-4, Requirement R3. The second sentence is covered by approved EOP-002-3.1a, Requirement R8 and can be retired.</p> <p>Proposed IRO-002-4 Requirement, R3:</p>

The recent draft Reliability Guideline – Reactive Power Planning and Operation page 20,⁷ discusses reactive resources. The following are a few paragraphs from the document:

Addressing “Sufficient” Reactive Resources

Reactive power planning and reactive needs in the operating horizon vary significantly between Transmission Operators across the NERC footprint. In the operating horizon, sufficient reactive resources need to be available to ensure that voltage levels, reactive flows, and reactive resources are monitored, controlled, and maintained within limits in Real-time to protect equipment and the reliable operation of the Interconnection. In the planning horizon, sufficient reactive resources need to be planned for, such that the transmission system can meet planning performance requirements and result in a system that can be operated reliably over a broad spectrum of system conditions and following a wide range of probable contingencies.

Deriving Voltage Schedules

A Transmission Operator develops system voltage schedules, often based on nominal voltage level and system-specific requirements. The schedule is provided to the Generator Owner as either a set point voltage level, range of acceptable operating voltages (set point with range), or power factor control set point. This operating point is generally required at the Point of Interconnection between the generator and transmission system. Generators are required to provide voltage or reactive power control to maintain system voltage levels for reliable transfer of active power to serve the load. Reactive resources are operated to stay within applicable facility ratings to protect equipment from abnormal voltage levels.

4. Action Items

- a. S. Solis and D. Sauriol to engage the TOP/IRO leadership from [Project 2014-03 Revisions to TOP and IRO Standards](#) and obtain additional background on the rationale for retiring IRO-005-3.1a, Requirements R1, 1.4 and R12, which was supported by the currently in effect VAR-001 and VAR-002 standards is being replaced by IRO-002-4. The following is from IRO-005-3.1a.

R1. Each Reliability Coordinator shall monitor its Reliability Coordinator Area parameters, including but not limited to the following:

R1.4. System real and reactive reserves (actual versus required).

From the draft Reliability Guideline – Reactive Power Planning and Operation page 20:⁸

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⁷ <http://www.nerc.com/pa/RAPA/rg/ReliabilityGuidelines/Reliability%20Guideline%20-%20Reactive%20Power%20Planning%20and%20Operations.pdf> (DRAFT)

⁸ <http://www.nerc.com/pa/RAPA/rg/ReliabilityGuidelines/Reliability%20Guideline%20-%20Reactive%20Power%20Planning%20and%20Operations.pdf>

Real-time to protect equipment and the reliable operation of the Interconnection. In the planning horizon, sufficient reactive resources need to be planned for, such that the transmission system can meet planning performance requirements and result in a system that can be operated reliably over a broad spectrum of system conditions and following a wide range of probable contingencies.

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- b. S. Barfield-McGinnis to provide S. Solis the TOP/IRO leadership contact information.
- c. S. Barfield-McGinnis to communicate with NERC staff the team's opinion that there is not reliability need (i.e., there is no redundancy) for the MRO SAR to move forward.
- d. S. Barfield-McGinnis to contact WECC concerning the regional variance in VAR-001-4.1 and the two Regional Reliability Standards, VAR-002-WECC-2 and VAR-501-WECC-2. Potentially arrange a meeting of the team leadership and various WECC stakeholders.

5. Future meeting(s)

- a. November 22, 2016, 2:00 – 4:00 p.m. Eastern
- b. December 6, 2016, 2:00 – 5:00 p.m. Eastern
- c. December 8, 2016, 2:00 – 5:00 p.m. Eastern
- d. Tentatively the week of January 23, 2017, if needed.

6. Adjourn

The meeting adjourned at 11:50 p.m. Eastern, Thursday, October 27, 2016.