

Project 2009-02 Consideration of Commission Directives in Order No. 693

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<p>P 905-906</p>	<p>Further, consistent with the NOPR, the Commission directs the ERO to modify IRO-002-1 to require a minimum set of tools that must be made available to the reliability coordinator. We believe this requirement will ensure that a reliability coordinator has the tools it needs to perform its functions.</p> <p>[t]he Commission clarifies that the Commission’s intent is to have the ERO develop a requirement that identifies capabilities, not actual tools or products. The Commission agrees that the latter approach is not appropriate as a particular product could become obsolete and technology improves over time.</p>	<p>Proposed IRO-018-1 addresses issues identified by the NERC Operating Committee's Real-time Tools Best Practices Task Force (RTBPTF) related to the availability and quality of the Reliability Coordinator's (RC) monitoring and analysis capabilities. The monitoring and analysis capabilities required by proposed IRO-018-1 and other IRO standards discussed below ensure RCs have the capabilities to maintain Real-time situational awareness.</p> <p><u>Monitoring Capabilities</u> Requirements R1 and R2 address the quality of the Real-time data needed by the RC to perform its monitoring and Real-time Assessments. Each RC is required to implement a documented procedure for addressing Real-time data quality issues. <u>The procedure must include criteria for evaluating Real-time data quality, provisions for indicating data quality to the System Operator, and actions to resolve Real-time data quality issues when data quality affects Real-time Assessments.</u> including invalid or time-late data, and must provide System Operators with information to indicate the quality of data received.</p> <p>Requirement R5 R3 addresses capabilities for operator awareness of failures in Real-time monitoring alarm processes by requiring RCs to use an independent alarm process monitor.</p> <p>Requirements for the RC to perform Real-time monitoring are specified in currently enforceable IRO-002-2, <u>IRO-002-4, and IRO-003-2,</u> and proposed IRO-002-4 from Project 2014-03.</p> <p><i>Proposed IRO-018-1</i></p>

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		<p>R1. Each Reliability Coordinator shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. The Operating Process or Operating Procedure shall include:</p> <p>1.1. Criteria for evaluating potential Real-time data<u>the quality of Real-time data</u>; discrepancies including, but not limited to:</p> <ul style="list-style-type: none"> 1.1.1. Data outside of a prescribed data range; 1.1.2. Analog data not updated within a predetermined time period; 1.1.3. Data entered manually to override telemetered information; and 1.1.1. Data otherwise identified as invalid or suspect. 1.1.4.<u>1.2.</u> Provisions to indicate the quality of Real-time data to the System Operator; and 1.2.1.3. <u>1.2.1.3.</u> Actions to resolve Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects Real-time Assessments. Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data. <p>R2. Each Reliability Coordinator shall provide its System Operators with indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments.</p> <p>R5<u>R3.</u> Each Reliability Coordinator shall have an alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred. Each Reliability Coordinator shall</p>

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		<p>utilize an independent alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred.</p> <p><i>Currently-enforceable IRO-002-2</i></p> <p>R5. Each Reliability Coordinator shall monitor Bulk Electric System elements (generators, transmission lines, buses, transformers, breakers, etc.) that could result in SOL or IROL violations within its Reliability Coordinator Area. Each Reliability Coordinator shall monitor both real and reactive power system flows, and operating reserves, and the status of Bulk Electric System elements that are or could be critical to SOLs and IROLs and system restoration requirements within its Reliability Coordinator Area.</p> <p><i>Currently-enforceable IRO-003-2</i></p> <p>R1. Each Reliability Coordinator shall monitor all Bulk Electric System facilities, which may include sub-transmission information, within its Reliability Coordinator Area and adjacent Reliability Coordinator Areas, as necessary to ensure that, at any time, regardless of prior planned or unplanned events, the Reliability Coordinator is able to determine any potential System Operating Limit and Interconnection Reliability Operating Limit violations within its Reliability Coordinator Area.</p> <p><i>Proposed IRO-002-4 (pending regulatory approval)</i></p> <p>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</p>

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		<p>Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.</p> <p><u>Analysis Capabilities</u> Requirements R3-R2 and R4 <u>addresses</u> the quality of the analysis used by the RC to perform its Real-time Assessments. Each RC is required to implement a documented procedure to maintain <u>address</u> the quality of the analysis used in its Real-time Assessments. <u>The procedure must include criteria for evaluating the quality of analysis used in Real-time Assessments, provisions for indicating the quality of analysis, and actions to resolve analysis quality issues affecting its Real-time Assessments, and must provide System Operators with information to indicate the quality of this analysis.</u></p> <p>Requirements for the RC to perform Real-time Assessments are specified in currently enforceable IRO-008-1 and proposed IRO-008-2.</p> <p><i>Proposed IRO-018-1</i> R3R2. Each Reliability Coordinator shall implement an Operating Process or Operating Procedure to maintain <u>address</u> the quality of any analysis used in its Real-time Assessments. The Operating Process or Operating Procedure shall include:</p> <p><u>3.1</u>. Criteria for evaluating the quality of any analysis used in its Real-time Assessments;</p> <p><u>2.2</u> <u>Provisions to indicate the quality of analysis used in its Real-time Assessments; and</u></p> <p>and</p>

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		<p>32.23. Actions to resolve <u>analysis</u> quality deficiencies in any analysis used in <u>issues affecting</u> its Real-time Assessments.</p> <p>R4. Each Reliability Coordinator shall provide its System Operators with indication(s) of the quality of any analysis used in its Real-time Assessments.</p> <p>Currently enforceable IRO-008-1</p> <p>R2. Each Reliability Coordinator shall perform a Real-Time Assessment at least once every 30 minutes to determine if its Wide Area is exceeding any IROLs or is expected to exceed any IROLs.</p> <p>Revised d) Definition of Real-time Assessment (pending regulatory approval)</p> <p>An evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions. The assessment shall reflect applicable inputs including, but not limited to: load, generation output levels, known Protection System and Special Protection System status or degradation, Transmission outages, generator outages, Interchange, Facility Ratings, and identified phase angle and equipment limitations. (Real-time Assessment may be provided through internal systems or through third-party services.)</p> <p>Proposed IRO-008-2 (pending regulatory approval)</p> <p>R4. Each Reliability Coordinator shall ensure that a Real-time Assessment is performed at least once every 30 minutes.</p>
P 1660	We adopt our proposal to require the ERO to develop a modification [to TOP standards] related to the provision of a	Proposed TOP-010-1 addresses issues identified by the NERC Operating Committee's Real-time Tools Best Practices Task

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	<p>minimum set of analytical tools. In response to LPPC and others, we note that our intent was not to identify specific sets of tools, but rather the minimum capabilities that are necessary to enable operators to deal with real-time situations and to ensure reliable operation of the Bulk-Power System.</p>	<p>Force (RTBPTF) related to the availability and quality of the monitoring and analysis capabilities used by Transmission Operators (TOPs) and Balancing Authorities (BAs). The monitoring and analysis capabilities required by proposed TOP-010-1 and other TOP standards discussed below ensure TOPs and BAs have the capabilities to maintain Real-time situational awareness.</p> <p><u>Monitoring Capabilities</u></p> <p>Requirements R1 through and R42 address the quality of the Real-time data needed by TOPs and BAs to perform their Real-time monitoring and Real-time analysis. Each TOP and BA is required to implement a documented procedure for addressing Real-time data quality issues, including invalid or time-late data, and must provide System Operators with information to indicate the quality of data received. <u>Each TOP and BA is required to implement a documented procedure for addressing Real-time data quality issues. The procedure must include criteria for evaluating Real-time data quality, provisions for indicating data quality to the System Operator, and actions to resolve Real-time data quality issues when data quality affects analysis.</u></p> <p>Requirement R7-R4 addresses capabilities for operator awareness of failures in Real-time monitoring alarm processes by requiring TOPs and BAs to use an independent alarm process monitor.</p> <p>Requirements for TOPs to perform Real-time monitoring are specified in currently enforceable <u>TOP-001-3 and</u> TOP-006-2 and proposed TOP 001 3 from Project 2014 03.</p>

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		<p>Requirements for BAs to perform Real-time monitoring are specified in currently-enforceable-TOP-006-2, proposed-TOP-001-3k from Project 2014-03, and BAL standards.</p> <p><i>Proposed TOP-010-1</i></p> <p>R1. Each Transmission Operator shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments. The Operating Process or Operating Procedure shall include:</p> <p>1.1. Criteria for evaluating potential<u>the quality of</u> Real-time data; quality discrepancies including, but not limited to:</p> <p>1.1.1. Data outside of a prescribed data range; 1.1.2. Analog data not updated within a predetermined time period; 1.1.3. Data entered manually to override telemetered information; and 1.1.4.1.1. Data otherwise identified as invalid or suspect.</p> <p><u>1.2. Provisions to indicate the quality of Real-time data to the System Operator; and</u> <u>1.2.1.3. Actions to resolve Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects Real-time Assessments.</u>Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data.</p> <p>R2. Each Balancing Authority shall implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its analysis</p>

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		<p>functions and Real-time monitoring. The Operating Process or Operating Procedure shall include:</p> <p>2.1 Criteria for evaluating <u>the quality of potential</u> Real-time data quality discrepancies including, but not limited to;</p> <p>2.1.1. Data outside of a prescribed data range;</p> <p>2.1.2. Analog data not updated within a predetermined time period;</p> <p>2.1.3. Data entered manually to override telemetered information; and</p> <p>2.1.4. Data otherwise identified as invalid or suspect.</p> <p>2.2 <u>Provisions to indicate the quality of Real-time data to the System Operator; and</u></p> <p>2.3 Actions to coordinate resolution of Real-time data quality discrepancies with the entity(ies) responsible for providing the data.</p> <p>R3. Each Transmission Operator shall provide its System Operators with indication(s) of the quality of the Real-time data necessary to perform its Real-time monitoring and Real-time Assessments.</p> <p>R4. Each Balancing Authority shall provide its System Operators with indication(s) of the quality of the Real-time data necessary to perform its analysis functions and Real-time monitoring.</p> <p>R7R4. Each Transmission Operator and Balancing Authority shall <u>have</u> utilize an independent alarm process monitor that provides notification(s) to its System Operators when a failure of its Real-time monitoring alarm processor has occurred.</p> <p>Currently enforceable TOP-006-2</p>

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		<p>R1. Each Transmission Operator and Balancing Authority shall know the status of all generation and transmission resources available for use.</p> <p>1.1. - Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use.</p> <p>1.2. - 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.</p> <p><i>Proposed TOP-001-3 (pending regulatory approval)</i></p> <p>R10. Each Transmission Operator shall perform the following as necessary for determining System Operating Limit (SOL) exceedances within its Transmission Operator Area:</p> <p>10.1. Within its Transmission Operator Area, monitor Facilities and the status of Special Protection Systems, and</p> <p>10.2. Outside its Transmission Operator Area, obtain and utilize status, voltages, and flow data for Facilities and the status of Special Protection Systems.</p> <p>R11. Each Balancing Authority shall monitor its Balancing Authority Area, including the status of Special Protection Systems that impact generation or Load, in order to maintain generation-Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.</p> <p><u>Analysis Capabilities</u> Requirements R53 and R6 addresses the quality of the analysis used by the TOP to perform its Real-time Assessments. Each</p>

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		<p>TOP is required to implement a documented procedure to maintain<u>address</u> the quality of the analysis used in its Real-time Assessments, and must provide System Operators with information to indicate the quality of this analysis. The procedure must include criteria for evaluating the quality of analysis used in Real-time Assessments, provisions for indicating the quality of analysis, and actions to resolve analysis quality issues affecting its Real-time Assessments.</p> <p>Requirements for the TOP to perform Real-time Assessments are specified in proposed TOP-003-3 from Project 2014-03.</p> <p><i>Proposed TOP-010-1</i></p> <p>R5R3. Each Transmission Operator shall implement an Operating Process or Operating Procedure to maintain<u>address</u> the quality of any analysis used in its Real-time Assessments. The Operating Process or Operating Procedure shall include:</p> <p>533.1. Criteria for evaluating the quality of any analysis used in its Real-time Assessments;</p> <p>533.2. <u>Provisions to indicate the quality of analysis used in its Real-time Assessments;</u> and</p> <p>5323. Actions to resolve <u>analysis quality issues affecting deficiencies in any analysis used in</u> its Real-time Assessments.</p> <p>R6. Each Transmission Operator shall provide its System Operators with indication(s) of the quality of any analysis used in its Real time Assessments.</p>

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		<p>Proposed Definition of Real-time Assessment (pending regulatory approval)</p> <p>An evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions. The assessment shall reflect applicable inputs including, but not limited to: load, generation output levels, known Protection System and Special Protection System status or degradation, Transmission outages, generator outages, Interchange, Facility Ratings, and identified phase angle and equipment limitations. (Real-time Assessment may be provided through internal systems or through third-party services.)</p> <p>Proposed TOP-001-3 (pending regulatory approval)</p> <p>R13. Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes.</p>
P 1875	<p>...[w]e 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.</p>	<p>The directive was considered in developing the scope of Project 2009-02. NERC believes currently enforceable IRO standards, proposed TOP, and IRO, and VAR standards, and currently enforceable VAR standards address the directive as discussed below. Accordingly, additional requirements were not developed in Project 2009-02.</p> <p>RCs and TOPs are required to periodically perform Real-time Assessments consisting of an evaluation of system conditions "to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions." Entities must use whatever analysis is necessary to obtain an evaluation of system conditions, which may include real-time voltage stability analysis. Real-time Assessments assist operators in maintaining operations within established SOLs and IROLs, to include voltage stability criteria. Requirements for performing Real-time Assessments are contained in currently enforceable</p>

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		<p>IRO-008-1, and proposed IRO-008-2, and TOP-001-3 Reliability Standards as discussed above.</p> <p>VAR-001-1 was revised in Project 2013-04. The resulting standard, VAR-001-4, did not include an explicit requirement for periodic performance of voltage stability analysis because "such analysis would be performed pursuant to the SOL methodology developed under FAC standards."¹ VAR-001-4 requirement R1 specifies the TOP must establish a system voltage schedule as part of its plan to operate within SOLs and IROLs.</p> <p><i>Currently enforceable VAR-001-4</i></p> <p>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.</p> <p>1.1. Each Transmission Operator shall provide a copy of the voltage schedules (which is either a range or a target value with an associated tolerance band) to its Reliability Coordinator and adjacent Transmission Operators within 30 calendar days of a request.</p>

¹ Reliability Standard VAR-001-4.1, Guidelines and Technical Basis section, page 13. Available at: <http://www.nerc.com/pa/Stand/Reliability%20Standards/VAR-001-4.1.pdf>