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proposed Reliability Standards meet the criteria identified by the Commission in Order No. 672<sup>6</sup> (**Exhibit C**), and a summary of the standard development history (**Exhibit H**). The proposed Reliability Standards were adopted by the NERC Board of Trustees on May 5, 2016.

This Petition is organized as follows: Section I of the Petition presents an executive summary of the proposed Reliability Standards. Section II of the Petition provides the individuals to whom notices and communications related to the filing should be provided. Section III provides background on the regulatory structure governing the Reliability Standards approval process. This section also provides information on the development of the proposed Reliability Standards through Project 2009-02, Real-time Reliability Monitoring and Analysis Capabilities and the Commission directives and report recommendations considered as part of the scope for this project. Section IV of the Petition provides a detailed discussion of the proposed Reliability Standards and explains how the proposed standards address report recommendations and satisfy certain outstanding Commission directives related to Real-time monitoring and analysis capabilities.

## I. **EXECUTIVE SUMMARY**

Inadequate situational awareness has been cited as one of the causes of the August 2003 blackout affecting the northeastern United States and Canada and the 2011 blackout affecting the southwestern United States and Baja, Mexico. Reports prepared following these events have provided recommendations for new and revised Reliability Standards to enhance Real-time situational awareness and address the other primary and contributing causes of these events.

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<sup>6</sup> The Commission specified in Order No. 672 certain general factors it would consider when assessing whether a particular Reliability Standard is just and reasonable. *See Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, FERC Stats. & Regs. ¶ 31,204, at P 262, 321-37, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

Over the last several years, NERC has addressed many of the recommendations from these reports. As a result, Reliability Standards affecting the operating reliability of the Bulk Electric System have improved significantly since first becoming mandatory in 2007. Among other things, the revised Transmission Operations (“TOP”) and Interconnection Reliability Operations and Coordination (“IRO”) Reliability Standards approved by the Commission in Order No. 817<sup>7</sup> (referred to herein as the “revised TOP and IRO Reliability Standards”) provide rigorous functional requirements for Real-time monitoring and analysis.

In reviewing these reports and the Commission’s outstanding directives from Order No. 693,<sup>8</sup> NERC identified further opportunity to enhance reliability and complement the existing functional requirements for Real-time monitoring and analysis. Specifically, NERC developed proposed Reliability Standards IRO-018-1 and TOP-010-1 to improve Real-time situational awareness capabilities and enhance reliable operations by requiring Reliability Coordinators, Transmission Operators, and Balancing Authorities to provide operators with awareness of monitoring and analysis capabilities, including alarm availability, so that operators may take appropriate steps to protect reliability. The proposed standards accomplish this as follows. First, the proposed standards require applicable entities to provide notification to operators of Real-time monitoring alarm failures. Second, the proposed standards require applicable entities to implement Operating Processes or Operating Procedures to: (i) provide operators with indication(s) of the quality of information being provided by their monitoring and analysis

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<sup>7</sup> Order No. 817, *Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards*, 153 FERC ¶ 61,178 (2015) (“Order No. 817”). In Order No. 817, the Commission approved Reliability Standards TOP-001-3, TOP-002-4, TOP-003-3, IRO-001-4, IRO-002-4, IRO-008-2, IRO-010-2, IRO-014-3, and IRO-017-1. However, the Commission directed that NERC make certain modifications to the standards within 18 months of the effective date of the Final Rule. See Order No. 817 at P 35, 47, and 51. These directives are currently being considered through Project 2016-01 Modifications to TOP and IRO Standards.

<sup>8</sup> Order No. 693, *Mandatory Reliability Standards for the Bulk-Power System*, FERC Stats. & Regs. ¶ 31,242 (“Order No. 693”), *order on reh’g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

capabilities; and (ii) address deficiencies in the quality of information being provided by their monitoring and analysis capabilities.

The proposed Reliability Standards address certain Commission directives from Order No. 693 related to requiring a minimum set of capabilities be made available to operators.<sup>9</sup> Further, the proposed Reliability Standards address certain recommendations from the 2008 report of the NERC Operating Committee Real-time Tools Best Practices Task Force (“RTBP Task Force”) relating to the availability of key Real-time monitoring and analysis capabilities.<sup>10</sup> The proposed Reliability Standards also address a recommendation from the joint FERC and NERC report on the 2011 Arizona-Southern California outage that entities take steps to ensure the adequacy and operation of their Real-time tools.<sup>11</sup> As such, the proposed Reliability Standards represent an important addition to the body of Reliability Standards for the reliability of the Bulk Power System.

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<sup>9</sup> See Order No. 693 at PP 905, 1660, and 1875 and *infra* Section III.C.

<sup>10</sup> See RTBP Task Force, *Real-Time Tools Survey Analysis and Recommendations* (Mar. 2008) (“2008 RTBP Task Force Report”), included as Exhibit G-2 to this Petition. The report is available on NERC’s website at: <http://www.nerc.com/comm/OC/Realtime%20Tools%20Best%20Practices%20Task%20Force%20RTBPTF%20Real-Time%20Tools%20Survey%20Analysis%20and%20Recommendations.pdf>.

As explained in further detail below, the RTBP Task Force was initiated in response to Recommendation 22 of the final report on the August 2003 blackout. See U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations (Apr. 2004) (“August 2003 Blackout Report”), available at <http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/BlackoutFinal-Web.pdf>. For convenience, the August 2003 Blackout Report is also included as Exhibit G-1 to this Petition.

<sup>11</sup> See FERC and NERC, *Arizona-Southern California Outages on September 8, 2011, Causes and Recommendations* (Apr. 2012) (“2011 Southwest Outage Report”), included as Exhibit G-3 to this Petition. The report is also available on NERC’s website at: [http://www.nerc.com/pa/rrm/ea/September%202011%20Southwest%20Blackout%20Event%20Document%20L/AZ%20Outage\\_Report\\_01MAY12.pdf](http://www.nerc.com/pa/rrm/ea/September%202011%20Southwest%20Blackout%20Event%20Document%20L/AZ%20Outage_Report_01MAY12.pdf).

## II. NOTICES AND COMMUNICATIONS

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## III. BACKGROUND

### A. **Regulatory Framework**

By enacting the Energy Policy Act of 2005,<sup>13</sup> Congress entrusted the Commission with the duties of approving and enforcing rules to ensure the reliability of the Bulk Power System, and with the duties of certifying an ERO that would be charged with developing and enforcing mandatory Reliability Standards, subject to Commission approval. Section 215(b)(1)<sup>14</sup> of the FPA states that all users, owners, and operators of the Bulk Power System in the United States will be subject to Commission-approved Reliability Standards. Section 215(d)(5)<sup>15</sup> of the FPA authorizes the Commission to order the ERO to submit a new or modified Reliability Standard. Section 39.5(a)<sup>16</sup> of the Commission’s regulations requires the ERO to file with the Commission for its approval each Reliability Standard that the ERO proposes should become mandatory and

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<sup>12</sup> Persons to be included on the Commission’s service list are identified by an asterisk. NERC respectfully requests a waiver of Rule 203 of the Commission’s regulations, 18 C.F.R. § 385.203 (2016), to allow the inclusion of more than two persons on the service list in this proceeding.

<sup>13</sup> 16 U.S.C. § 824o (2012).

<sup>14</sup> *Id.* § 824o(b)(1).

<sup>15</sup> *Id.* § 824o(d)(5).

<sup>16</sup> 18 C.F.R. § 39.5(a) (2016).



enforceable in the United States, and each modification to a Reliability Standard that the ERO proposes should be made effective.

The Commission is vested with the regulatory responsibility to approve Reliability Standards that protect the reliability of the Bulk Power System and to ensure that Reliability Standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. Pursuant to Section 215(d)(2) of the FPA<sup>17</sup> and Section 39.5(c)<sup>18</sup> of the Commission's regulations, the Commission will give due weight to the technical expertise of the ERO with respect to the content of a Reliability Standard.

#### **B. NERC Reliability Standards Development Procedure**

The proposed Reliability Standards were developed in an open and fair manner and in accordance with the Commission-approved Reliability Standard development process.<sup>19</sup> NERC develops Reliability Standards in accordance with Section 300 (Reliability Standards Development) of its Rules of Procedure and the NERC Standard Processes Manual.<sup>20</sup>

In its order certifying NERC as the Commission's ERO, the Commission found that NERC's proposed rules provide for reasonable notice and opportunity for public comment, due process, openness, and a balance of interests in developing Reliability Standards,<sup>21</sup> and thus satisfy certain of the criteria for approving Reliability Standards.<sup>22</sup> The development process is open to any person or entity with a legitimate interest in the reliability of the Bulk Power System.

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<sup>17</sup> 16 U.S.C. § 824o(d)(2).

<sup>18</sup> 18 C.F.R. § 39.5(c)(1).

<sup>19</sup> Order No. 672, *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, FERC Stats. & Regs. ¶ 31,204, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

<sup>20</sup> The NERC Rules of Procedure are available at <http://www.nerc.com/AboutNERC/Pages/Rules-of-Procedure.aspx>. The NERC Standard Processes Manual is available at [http://www.nerc.com/comm/SC/Documents/Appendix\\_3A\\_StandardsProcessesManual.pdf](http://www.nerc.com/comm/SC/Documents/Appendix_3A_StandardsProcessesManual.pdf).

<sup>21</sup> *N. Am. Elec. Reliability Corp.*, 116 FERC ¶ 61,062 at P 250 (2006).

<sup>22</sup> Order No. 672 at PP 268, 270.

NERC considers the comments of all stakeholders. Stakeholders must approve, and the NERC Board of Trustees must adopt, a Reliability Standard before NERC submits the Reliability Standard to the Commission for approval.

**C. Commission Directives Relating to Real-time Monitoring and Analysis Capabilities**

In Order No. 693, the Commission approved 83 Reliability Standards, including the original TOP and IRO Reliability Standards. While approving those standards, the Commission directed NERC to develop modifications to ensure that operating entities would have adequate tools to perform their Real-time reliability functions.

First, the Commission directed NERC to develop modifications to Reliability Standard IRO-002-1 – Reliability Coordination – Facilities<sup>23</sup> as follows:

[T]he 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 that this requirement will ensure that a reliability coordinator has the tools it needs to perform its functions. Further...such a requirement promotes a more proactive approach to maintaining reliability.<sup>24</sup>

As “a particular product could become obsolete and technology improves over time,” the Commission clarified that its intent behind this directive was “to have the ERO develop a requirement that identifies capabilities, not actual tools or products.”<sup>25</sup>

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<sup>23</sup> Order No. 693 at P 905. The Commission approved the currently-effective version of the standard, IRO-002-2, in Docket No. RM10-15-000. *See* Order No. 748, *Mandatory Reliability Standards for Interconnection Reliability Operating Limits*, 134 FERC ¶ 61,213, *order on clarification*, Order No. 748-A, 136 FERC ¶ 61,030 (2011) (“Order No. 748”). In Order No. 817, the Commission approved Reliability Standard IRO-002-4 – Reliability Coordination – Monitoring and Analysis, to become effective April 1, 2017.

<sup>24</sup> Order No. 693 at P 905.

<sup>25</sup> Order No. 693 at P 906.

Second, the Commission directed NERC to develop modifications to TOP-006-1 – Monitoring System Conditions.<sup>26</sup> Again, the Commission stated that its intent was for NERC to identify minimum capabilities, not specific sets of tools:

We adopt our proposal to require the ERO to develop a modification related to the provision of a minimum set of analytical tools . . . 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.<sup>27</sup>

In addition to the revisions to TOP and IRO standards, the Commission directed NERC to develop a modification to Reliability Standard VAR-001-1 – Voltage and Reactive Control related to Real-time tools.<sup>28</sup> Specifically, the Commission directed NERC to modify the standard to require periodic performance of voltage stability analysis “using online techniques where commercially available, and offline simulation tools where online tools are not available, to assist Real-time operations.”<sup>29</sup>

#### **D. Report Recommendations Relating to Real-time Monitoring and Analysis Capabilities**

The Commission’s Order No. 693 directives highlighted the need for a minimum set of capabilities to be available to assist operators in making Real-time decisions, a concern that has been echoed in reports prepared following the August 2003 blackout and the 2011 Southwest outage events. Reliability Standards relating to the operating reliability of the Bulk Power

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<sup>26</sup> Order No. 693 at P 1660. The Commission approved the currently-effective version of the standard, TOP-006-2, in Order No. 748. In Order No. 817, the Commission approved three TOP Reliability Standards to replace the existing suite of TOP standards, including Reliability Standard TOP-006-2, effective April 1, 2017.

<sup>27</sup> Order No. 693 at P 1660.

<sup>28</sup> Order No. 693 at P 1875. VAR-001 was most recently revised as part of Project 2013-04 – Voltage and Reactive Control and was approved by the Commission in Docket No. RD14-11-000. *See N. Am. Elec. Reliability Corp.* (Aug. 1, 2014) (unpublished letter order) and *N. Am. Elec. Reliability Corp.*, Docket No. RD15-6-000 (Nov. 13, 2015) (unpublished letter order) (approving errata version VAR-001-4.1).

<sup>29</sup> *See* Order No. 693 at ¶ 1875.

System have improved significantly since 2007, and many of the issues and recommendations highlighted in these reports have since been addressed. However, these reports provide additional considerations for improving Real-time monitoring and analysis capabilities, as discussed below.

1. The August 2003 Blackout Report and the 2008 RTBP Task Force Report

The largest blackout in history to affect North America began on the afternoon of August 14, 2003 and disrupted over 61,800 megawatts of electric load in the northeastern United States and the Canadian province of Ontario. The August 2003 Blackout Report identified inadequate situational awareness as one of the key causes of the blackout, among a number of principal and contributing causes.<sup>30</sup> The August 2003 blackout was linked to dysfunction of Supervisory Control and Data Acquisition and energy management systems.<sup>31</sup> Additionally, investigators pointed out that several deficiencies leading to the August 2003 blackout were identified as weaknesses in previous outages, indicating the need for more effective response.<sup>32</sup> A recurring recommendation focused on providing capabilities for operators to evaluate courses of action. These observations led to Recommendation 22 of the August 2003 Blackout Report for NERC to “evaluate and adopt better real-time tools for operators and reliability coordinators.”<sup>33</sup>

In response to this recommendation, NERC formed the RTBP Task Force in 2004. The RTBP Task Force was charged with identifying the best practices for Real-time reliability tools used to build and maintain Real-time network models, perform state estimation and contingency analysis, and maintain situational awareness in accordance with NERC Reliability Standards. The RTBP Task Force was also instructed to develop guidelines for minimally acceptable

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<sup>30</sup> See August 2003 Blackout Report at 18.

<sup>31</sup> See, e.g., *id.* at 52.

<sup>32</sup> See *id.* at 159.

<sup>33</sup> *Id.*

capabilities for these reliability tools and to recommend specific requirements to be included in Reliability Standards for these tools. In 2008, following extensive information gathering and analysis, the RTBP Task Force issued a report which included recommendations for new and enhanced Reliability Standards, operating guidelines, and areas for further analysis.

In the years since the issuance of this report, many of its recommendations have been addressed by other Reliability Standards, including the revised TOP and IRO Reliability Standards. However, certain recommendations relating to Real-time monitoring and analysis capabilities were not fully addressed or remained to be considered.

Among these recommendations was the recommendation that NERC develop new or revised Reliability Standards to mandate certain tools as mandatory monitoring and analysis tools.<sup>34</sup> The RTBP Task Force also recommended developing new or revised Reliability Standards to address availability of various monitoring and analysis capability processes,<sup>35</sup> as well as to “monitor and maintain awareness of critical equipment status to ensure that lack of availability of critical equipment does not impair reliable operation.”<sup>36</sup>



Collectively, these recommendations center on developing Reliability Standards that would enhance situational awareness by providing operator awareness of key monitoring and analysis capabilities, including when alarms are not available or performing their intended function.

## 2. The 2011 Southwest Outage Report

The need for improved Real-time monitoring and analysis capabilities was again highlighted in the 2011 Southwest Outage Report. On the afternoon of September 8, 2011, the

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<sup>34</sup> Specifically, alarm tools, telemetry data systems, network topology processor, state estimator, and contingency analysis. *See* 2008 RTBP Task Force Report at Summary of Recommendations (Recommendation S1).

<sup>35</sup> *See, e.g., id.* Recommendation S7 (“Specify and measure minimum availability for alarm tools.”).

<sup>36</sup> *See id.* Recommendation S40.

loss of a single 500 kV line led to widespread cascading outages affecting 2.7 million customers in Arizona, Southern California, and Baja, Mexico. Like the August 2003 blackout, this event was partly due to, or exacerbated by, inadequate Real-time situational awareness. Inadequate operations planning was a significant factor in the failure to maintain a secure N-1 state.<sup>37</sup> However, the 2011 Southwest Outage Report also highlighted several concerns with entities and their ability to monitor, identify, and plan for the next critical contingency in Real-time.<sup>38</sup>

Recommendation 12 of this report states that entities “should take measures to ensure that their real-time tools are adequate, operational, and run frequently enough to provide their operators the situational awareness necessary to identify and plan for contingencies and reliably operate their systems.”<sup>39</sup> While the 2011 Southwest Outage Report’s recommendations relating to operations planning, Real-time situational awareness, and frequency of Real-time monitoring and analysis have been primarily addressed by the revised TOP and IRO Reliability Standards,<sup>40</sup> the parts of Recommendation 12 relating to adequacy and operation of Real-time tools are not explicitly covered by Reliability Standard requirements and therefore present areas for improvement.

#### **E. Project 2009-02, Real-time Reliability Monitoring and Analysis Capabilities**

Project 2009-02 was formed to address issues relating to Real-time reliability monitoring and analysis capabilities, as highlighted in the Commission’s Order No. 693 directives and the report recommendations discussed in the preceding section. Project 2009-02 was first initiated in

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<sup>37</sup> 2011 Southwest Outage Report at 5.

<sup>38</sup> *Id.*

<sup>39</sup> *Id.* at 89.

<sup>40</sup> See *Petition of the North American Electric Reliability Corporation for Approval of Proposed Transmission Operations and Interconnection Reliability Operations and Coordination Reliability Standards*, Docket No. RM15-16-000 (Mar. 18, 2015) at Ex. F (Mapping Document of Proposed Reliability Standards to Southwest Outage Report Recommendations).

2009 in response to the work of the RTBP Task Force and used the 2008 RTBP Task Force Report as the basis for the initial work. A Standard Authorization Request (“SAR”) drafting team worked to develop a SAR and a concept white paper to establish requirements for the “functionality, performance, and maintenance of Real-time Monitoring and Analysis Capabilities.”<sup>41</sup> In early 2011, formal development on Project 2009-02 was paused to prioritize efforts on other projects, including other projects to revise the TOP and IRO Reliability Standards.

NERC resumed work on Project 2009-02 in early 2015. As many Reliability Standards and definitions had been developed or revised in the intervening years, including the revised TOP and IRO Reliability Standards, it was necessary to develop a new project scope to determine which issues had been addressed through other projects and which issues remained to be addressed through Project 2009-02.

To develop the new project scope, the Project 2009-02 drafting team reviewed the prior work on the project, the Commission’s directives from Order No. 693 relating to Real-time monitoring and analysis capabilities, and the findings and recommendations of the August 2003 Blackout Report and the 2008 RTPB Task Force Report. The drafting team also reviewed the 2011 Southwest Outage Report, which was issued after the initial work on Project 2009-02 was paused in 2011, as well as recently-developed Reliability Standards addressing Real-time situational awareness.<sup>42</sup> In June 2015, the drafting team hosted a technical conference to obtain

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<sup>41</sup> See Ex. H (Summary of Development and Complete Record of Development) Item 15, April 2010 Standard Authorization Request.

<sup>42</sup> To assist in its work, the drafting team prepared a comprehensive mapping document to show which report recommendations relating to Real-time monitoring and analysis capabilities had been addressed through other Reliability Standards and which recommendations remained to be considered. See Exhibit F (Standard Authorization Request Justification, Project 2009-02) Appendix – Report Recommendations.

industry input on reliability issues to be addressed in this project and to hear industry perspectives on the use of Real-time situational awareness capabilities for reliable operations.

Based on its comprehensive review and outreach, the Project 2009-02 drafting team determined that identified reliability issues persist in the area of Real-time situational awareness capabilities. The Project 2009-02 drafting team determined that reliability could be improved by: (i) promoting a common understanding of monitoring as it applies to Real-time situational awareness; (ii) providing operators with indication(s) of the quality of information being provided by monitoring and analysis capabilities; and (iii) providing operators with notification(s) during unplanned loss of monitoring capabilities.

Although certain recommendations from the 2008 RTBP Task Force Report recommended developing Reliability Standards to require a minimum set of tools, the Project 2009-02 drafting team concluded that prescriptive requirements for Real-time tools should not be within the scope of Project 2009-02. The revised definition of Real-time Assessment and the requirements in Reliability Standards IRO-008-2 and TOP-001-3, discussed below, provide applicable entities with the flexibility to determine which Real-time tools, such as state estimator, contingency analysis, and stability applications, are necessary to meet their Real-time reliability functions. Therefore, rather than prescribing specific tools, the Project 2009-02 drafting team determined that it would be appropriate to address the recommendations by developing technology-neutral Reliability Standards.

The drafting team began work on proposed Reliability Standards IRO-018-1 and TOP-010-1 in August 2015. Following two comment and ballot periods, the proposed standards were approved by the ballot pool in February 2016. The NERC Board of Trustees adopted the proposed standards on May 5, 2016.



#### IV. JUSTIFICATION FOR APPROVAL

As discussed in **Exhibit C** and below, proposed **Reliability Standards IRO-018-1 and TOP-010-1** satisfy the Commission's criteria in Order No. 672, and are just, reasonable, not unduly discriminatory or preferential, and in the public interest.

Maintaining adequate situational awareness is essential for the reliable operation of the Bulk Power System. As described in the 2008 RTBP Task Force Report, situational awareness means "ensuring that accurate information on current system conditions, including the likely effects of future contingencies, is continuously available in a form that allows operators to quickly grasp and fully understand actual operating conditions and take corrective action when necessary to maintain or restore reliable operations."<sup>43</sup> **Situational awareness may be thought of as encompassing two broad capabilities: monitoring and analysis.** To be effective in support of situational awareness, Real-time monitoring and analysis must:

- be performed with sufficient frequency to allow operators to understand operating conditions and take corrective actions when necessary;
- provide awareness of information quality to allow operators to assess the accuracy of information being received on system conditions and take corrective actions when necessary; and
- indicate when monitoring or analysis processes are not operating normally or are unavailable in order to provide operator awareness of the accuracy of the information being provided.<sup>44</sup>

The existing, Commission-approved Reliability Standards, including the revised TOP and IRO Reliability Standards and revised definition of Real-time Assessment, provide rigorous requirements for performing Real-time monitoring and analysis to support the reliable operation of the Bulk Power System. However, reliability would be improved by instituting requirements

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<sup>43</sup> 2008 RTBP Task Force Report at 3.

<sup>44</sup> See Ex. F (Standard Authorization Request Justification, Project 2009-02) at 10.

to provide operator awareness of monitoring, alarming, and analysis quality and tool availability to perform as intended. Proposed Reliability Standards IRO-018-1 and TOP-010-1 support effective Real-time monitoring and analysis and thereby enhance reliable operations by ensuring that:

- operators are provided with indications of the quality of information being provided by monitoring and analysis capabilities;
- applicable entities have procedures in place to identify and address high-priority data and analysis quality issues; and
- operators receive notifications during unplanned loss of alarming capabilities.

In this section, NERC: (i) describes how the proposed Reliability Standards complement the revised TOP and IRO Reliability Standards and definitions approved by the Commission in Order No. 817 to improve Real-time situational awareness;<sup>45</sup> (ii) discusses the requirements of the proposed standards on a requirement-by-requirement basis; and (iii) explains how the proposed standards address the report recommendations and Commission directives related to Real-time monitoring and awareness capabilities.

#### **A. Overview of Requirements Relating to Real-time Monitoring and Analysis Capabilities**

Real-time monitoring, or monitoring the Bulk Electric System in Real-time, is a primary function of Reliability Coordinators, Transmission Operators, and Balancing Authorities as required by TOP and IRO Reliability Standards. As used in TOP and IRO Reliability Standards, monitoring involves observing operating status and operating values in Real-time for awareness of system conditions. Real-time monitoring may include the following activities performed in Real-time:

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<sup>45</sup> Requirements for Real-time monitoring and analysis are also contained in currently-effective Reliability Standards which are pending retirement under the Project 2014-03 implementation plan. Please refer to Exhibit E (Consideration of Directives) for the currently-effective requirements.

- Acquisition of operating data;
- Display of operating data as needed for visualization of system conditions;
- Audible or visual alerting when warranted by system conditions; and
- Audible or visual alerting when monitoring and analysis capabilities degrade or become unavailable.

Requirements for the Reliability Coordinator, Transmission Operator, and Balancing Authority to perform Real-time monitoring are specified in Commission-approved Reliability Standards IRO-002-4<sup>46</sup> (Reliability Coordinator); TOP-001-3<sup>47</sup> (Transmission Operator); and TOP-001-3<sup>48</sup> and the BAL standards (Balancing Authority).

The analysis component of Real-time situational awareness is described by the revised definition of Real-time Assessment:

### **Real-time Assessment**

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

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<sup>46</sup> See IRO-002-4 Requirement 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.

<sup>47</sup> See TOP-001-3 Requirement R10:

R10. Each Transmission Operator shall perform the following as necessary for determining System Operating Limit (SOL) exceedances within its Transmission Operator Area:

10.1. Within its Transmission Operator Area, monitor Facilities and the status of Special Protection Systems, and

10.2. Outside its Transmission Operator Area, obtain and utilize status, voltages, and flow data for Facilities and the status of Special Protection Systems.

<sup>48</sup> See TOP-001-3 Requirement R11:

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.

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.)

Requirements for the Reliability Coordinator to perform Real-time Assessments are specified in IRO-008-2,<sup>49</sup> and requirements for the Transmission Operator to perform Real-time Assessments are specified in TOP-001-3.<sup>50</sup>

The Reliability Coordinator uses a set of Real-time data identified in IRO-010-2 Requirement R1 to perform its Real-time monitoring and Real-time Assessments, whereas the Transmission Operator uses a set of Real-time data identified in TOP-003-3 Requirement R1. The Balancing Authority uses a set of Real-time data identified in TOP-003-3 Requirement R2 to perform its analysis functions and Real-time monitoring.

Proposed Reliability Standards IRO-018-1 and TOP-010-1 do not create new obligations to perform Real-time monitoring or analysis. Rather, the proposed standards build upon existing requirements to support effective Real-time monitoring and analysis and improved situational awareness and thereby enhance reliable operations. Proposed Reliability Standard IRO-018-1 is applicable to Reliability Coordinators. Proposed Reliability Standard TOP-010-1 contains Requirements which are applicable to Transmission Operators and Balancing Authorities.



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<sup>49</sup> See IRO-008-2 Requirement R4:

Each Reliability Coordinator shall ensure that a Real-time Assessment is performed at least once every 30 minutes.

<sup>50</sup> See revised definition of Real-time Assessment and TOP-001-3 Requirement R13:

Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes.

## **B. Proposed Reliability Standard Requirements**

### **1. Requirements to Address Real-time Data Quality Issues: IRO-018-1 R1, TOP-010-1 R1, and TOP-010-1 R2**

As noted in the preceding section, existing Reliability Standards contain requirements to perform monitoring and Real-time Assessments. Proposed Reliability Standards IRO-018-1 Requirement R1, TOP-010-1 Requirement R1, and TOP-010-1 Requirement R2 build upon these requirements to support effective situational awareness by requiring each Reliability Coordinator, Transmission Operator, and Balancing Authority to implement an Operating Process<sup>51</sup> or Operating Procedure<sup>52</sup> to address the quality of the Real-time data necessary to perform its Real-time data monitoring and Real-time Assessments or analysis functions. Entities continue to address lower-priority data quality issues (i.e. data quality issues not affecting Real-time monitoring or analysis) according to their operating practices.

These requirements, along with the proposed requirements discussed in the subsequent sections, address recommendations from the 2008 RTBP Task Force Report by specifying monitoring and analysis capabilities for situational awareness. Further, the proposed requirements address the 2011 Southwest Outage Report's recommendation that entities should take measures to ensure the adequacy and operation of their Real-time tools.

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<sup>51</sup> Operating Process is defined in the *Glossary of Terms Used in NERC Reliability Standards* ("Glossary") as:  
A document that identifies general steps for achieving a generic operating goal. An Operating Process includes steps with options that may be selected depending upon Real-time conditions. A guideline for controlling high voltage is an example of an Operating Process.

<sup>52</sup> Operating Procedure is defined in the Glossary as:  
A document that identifies specific steps or tasks that should be taken by one or more specific operating positions to achieve specific operating goal(s). The steps in an Operating Procedure should be followed in the order in which they are presented, and should be performed by the position(s) identified. A document that lists the specific steps for a system operator to take in removing a specific transmission line from service is an example of an Operating Procedure.

The specific requirements are as follows.

IRO-018-1 Requirement R1, applicable to Reliability Coordinators, provides:

**IRO-018-1**

**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: [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

- 1.1. Criteria for evaluating the quality of Real-time data;
- 1.2. Provisions to indicate the quality of Real-time data to the System Operator; and
- 1.3. Actions to address Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects Real-time Assessments.

Proposed Reliability Standard TOP-010-1 Requirement R1 contains identical requirements applicable to Transmission Operators.

Similarly, proposed Reliability Standard TOP-010-1 Requirement R2 requires each Balancing Authority to implement an Operating Process or Operating Procedure to address the quality of the Real-time data necessary to perform its required analysis functions and Real-time monitoring as follows:

**TOP-010-1**

**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 functions and Real-time monitoring. The Operating Process or Operating Procedure shall include: [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

- 2.1. Criteria for evaluating the quality of Real-time data;
- 2.2. Provisions to indicate the quality of Real-time data to the System Operator; and
- 2.3. Actions to address Real-time data quality issues with the entity(ies) responsible for providing the data when data quality affects its analysis functions.

The Operating Process or Operating Procedure required by proposed IRO-018-1 Requirement R1 and proposed TOP-010-1 Requirements R1 and R2 consists of three parts. **First,** the Operating Process or Operating Procedure must contain criteria for evaluating the quality of Real-time data. As described in the Guidelines and Technical Basis section of the proposed standards, the criteria support identification of data quality issues, which may include: (i) data outside of a prescribed data range; (ii) analog data not updated within a predetermined time period; (iii) data entered manually to override telemetered information; or (iv) data otherwise identified as invalid or suspect.

**Second,** the Operating Process or Operating Procedure must include provisions for indicating the quality of Real-time data to operating personnel. To satisfy this requirement, the applicable entity could use descriptions of quality indicators such as display color codes, data quality flags, or other such indicators as found in Real-time monitoring specifications.

**Third,** the required Operating Process or Operating Procedure must include actions to address Real-time data quality issues affecting the Reliability Coordinator or Transmission Operator's Real-time Assessments, or in the case of the Balancing Authority, Real-time data quality issues affecting its analysis functions.

In drafting these requirements, the Project 2009-02 drafting team recognized that the applicable entity may have limited ability to resolve (or correct) bad or suspect data coming from a third party. Therefore, the proposed requirements provide applicable entities with the flexibility to determine which steps are appropriate to maintain adequate situational awareness. **The actions an entity may take to address Real-time data quality issues could be the same as the process used to resolve data conflicts required by IRO-010-2 Requirement R3 Part 3.2 or TOP-003-3 Requirement R5 Part 5.2, provided that this process addresses Real-time data quality issues.**

Other examples of actions to address data quality issues include, but are not limited to: (i) notifying the entities that are providing the Real-time data; (ii) taking corrective actions on the applicable entity's own data; (iii) changing data sources or other inputs so the data quality issue no longer affects Real-time Assessments; or (iv) entering data manually and updating as necessary.

2. Requirements to Address the Quality of Analysis used in Real-time Assessments: IRO-018-1 R2 and TOP-010-1 R3

Proposed Reliability Standards IRO-018-1 Requirement R2 and TOP-010-1 Requirement R3 ensure that Reliability Coordinators and Transmission Operators implement Operating Processes or Operating Procedures to address issues related to the quality of the analysis used in Real-time Assessments. As discussed above, requirements to perform Real-time Assessments appear in other Reliability Standards. Examples of the type of analysis used in Real-time Assessments may include state estimation, Real-time contingency analysis, stability analysis, or other studies used for Real-time Assessments.

Proposed IRO-018-1 Requirement R2, applicable to Reliability Coordinators, provides as follows:

**R2.** Each Reliability Coordinator shall implement an Operating Process or Operating Procedure to address the quality of analysis used in its Real-time Assessments. The Operating Process or Operating Procedure shall include: [*Violation Risk Factor: Medium*] [*Time Horizon: Real-time Operations*]

- 2.1.** Criteria for evaluating the quality of analysis used in its Real-time Assessments;
- 2.2.** Provisions to indicate the quality of analysis used in its Real-time Assessments; and
- 2.3.** Actions to address analysis quality issues affecting its Real-time Assessments.

Proposed Reliability Standard TOP-010-1 Requirement R3 contains identical requirements applicable to Transmission Operators.



These requirements have the same general structure as the proposed requirements for data quality issues. First, the Reliability Coordinator or Transmission Operator's Operating Process or Operating Procedure must include criteria for evaluating the quality of analysis. Examples of the types of criteria that may be used to evaluate the quality of analysis include, but are not limited to, solution tolerances, correlation with Real-time data, or the number of contingencies analyzed from the set of potential contingencies.

Second, the Operating Process or Operating Procedure must describe how the quality of analysis results used in Real-time Assessments will be shown to operating personnel. Operating personnel includes System Operators and staff responsible for supporting Real-time operations.

Third, the Operating Process or Operating Procedure must include actions to address those analysis quality issues affecting its Real-time Assessments. Similar to the requirements for data quality issues, Reliability Coordinators and Transmission Operators have flexibility to determine the appropriate actions to take in situations where analysis quality issues are affecting their ability to perform Real-time Assessments.

3. Requirements for Alarm Processor Failure Monitoring: IRO-018-1 R3, TOP-010-1 R4

In the 2008 RTBP Task Force Report, the RTBP Task Force recommended developing a requirement to specify minimum availability of alarm tools (Recommendation S7). Proposed Reliability Standards IRO-018-1 Requirement R3 and TOP-010-1 Requirement R4 address the situational awareness objectives associated with this recommendation by providing for operator awareness when key alarming tools are not performing as intended.

Proposed Reliability Standard IRO-018-1 Requirement R3, applicable to Reliability Coordinators, states:

**R3.** 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.  
[Violation Risk Factor: Medium] [Time Horizon: Real-time Operations]

Proposed TOP-010-1 Requirement R4 contains an identical requirement applicable to Transmission Operators and Balancing Authorities.

As specified in the Guidelines and Technical Basis section of the proposed Reliability Standards, the alarm process monitor should be designed and implemented such that a stall of the Real-time monitoring alarm processor does not cause a failure of the alarm process monitor. The proposed requirements provide applicable entities with flexibility to determine whether to use an alarm process monitor that is a separate system or an application within a Real-time monitoring system.



### C. Consideration of FERC Directives

As discussed in Section III.C above, the Commission directed NERC in Order No. 693 to modify TOP and IRO Reliability Standards to require a minimum set of capabilities be made available to operators.<sup>53</sup> Although the Commission contemplated modifications to specific Reliability Standards, NERC submits that proposed Reliability Standards IRO-018-1 and TOP-010-1, together with other currently-effective and Commission-approved Reliability Standards, address the reliability concerns underlying the Commission's directives in an equally effective and efficient manner, as set forth below.

#### 1. Order No. 693 P 905 Directive

In Order No. 693, the Commission directed NERC to modify IRO-002-1 to develop a requirement that identifies the minimum capabilities that must be made available to the Reliability Coordinator to ensure “that a reliability coordinator has the tools it needs to perform

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<sup>53</sup> Order No. 693 at P 905-906 (directing NERC to modify IRO-002-1) and P 1660 (directing NERC to modify TOP-006-1).

its functions.”<sup>54</sup> The monitoring and analysis capabilities required by proposed Reliability Standard IRO-018-1 and other IRO Reliability Standards ensure Reliability Coordinators have the capabilities to maintain Real-time situational awareness.

***Monitoring capabilities.*** Requirements for the Reliability Coordinator to perform Real-time monitoring are specified in Commission-approved Reliability Standard IRO-002-4.<sup>55</sup> As discussed in the preceding section, proposed Reliability Standard IRO-018-1 Requirement R1 addresses the quality of the Real-time data needed by the Reliability Coordinator to perform its monitoring and Real-time Assessments by requiring each Reliability Coordinator to implement a documented procedure to address data quality issues. Proposed IRO-018-1 Requirement R3 addresses capabilities for operator awareness of failures in Real-time monitoring alarm processes by requiring Reliability Coordinators to have an alarm process monitor.

***Analysis Capabilities.*** Requirements for the Reliability Coordinator to perform Real-time Assessments are specified in Commission-approved Reliability Standard IRO-008-2 and the approved revised definition of Real-time Assessment. Under proposed Reliability Standard IRO-018-1 Requirement R2, each Reliability Coordinator is required to implement a documented procedure to address the quality of the analysis used in its Real-time Assessments.

## 2. Order No. 693 P 1660 Directive

In Order No. 693, the Commission directed NERC to develop a modification to Reliability Standard TOP-006-1 related to the provision of a minimum set of analytical tools (i.e. capabilities) “that are necessary to enable operators to deal with real-time situations and to ensure reliable operation of the Bulk-Power System.”<sup>56</sup> As discussed below, the monitoring and

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<sup>54</sup> Order No. 693 at P 905.

<sup>55</sup> As noted above, please refer to Exhibit E (Consideration of Directives) for the currently-effective requirements for Real-time monitoring and analysis.

<sup>56</sup> Order No. 693 at P 1660.

analysis capabilities required by proposed TOP-010-1 and other Commission-approved TOP Reliability Standards ensure that Transmission Operators and Balancing Authorities have the capabilities to maintain Real-time situational awareness and thus address the Commission’s directive in an equally effective and efficient manner.

***Monitoring Capabilities.*** Requirements for Transmission Operators and Balancing Authorities to perform Real-time monitoring are specified in Commission-approved Reliability Standard TOP-001-3 and the BAL Reliability Standards. As discussed in the preceding section, proposed Reliability Standard TOP-010-1 Requirements R1 and R2 address the quality of the Real-time data needed by Transmission Operators and Balancing Authorities to perform their Real-time monitoring and Real-time Assessments or analysis functions by requiring these entities to implement a documented procedure for addressing data quality issues. Proposed Reliability Standard TOP-010-1 Requirement R4 addresses capabilities for operator awareness of failures in Real-time monitoring alarm processes by requiring Transmission Operators and Balancing Authorities to have an alarm process monitor.

***Analysis Capabilities.*** Requirements for the Transmission Operator to perform Real-time Assessments are specified in Commission-approved Reliability Standard TOP-001-3. Under proposed Reliability Standard TOP-010-1 Requirement R3, each Transmission Operator is required to implement a documented procedure to address the quality of the analysis used in its Real-time Assessments.

3. Order No. 693 P 1875 Directive

In addition to the two directives discussed above, the Commission also directed NERC to modify Reliability Standard VAR-001-1 to “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.”<sup>57</sup>

This directive was considered in establishing the scope of Project 2009-02. However, NERC maintains that this directive has now been addressed by other TOP, IRO, and VAR standards approved by the Commission. Accordingly, Project 2009-02 did not develop additional requirements to address this directive. NERC respectfully requests that the Commission find that the concerns underlying this directive have been addressed in an equally effective and efficient manner through the framework provided by these other standards.

Reliability Standard VAR-001 was most recently revised in Project 2013-04 Voltage & Reactive Control.<sup>58</sup> Reliability Standard VAR-001-4.1 Requirement R1 provides that the Transmission Operator shall specify a system voltage schedule as part of its plan to operate within System Operating Limits (“SOLs”) and Interconnection Reliability Operating Limits (“IROLs”). Reliability Standard VAR-001-4.1 does 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.”<sup>59</sup>

Reliability Coordinators and Transmission Operators 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.”<sup>60</sup> Requirements for performing Real-time Assessments are contained in currently-effective Reliability Standard IRO-

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<sup>57</sup> Order No. 693 at P 1875.

<sup>58</sup> Reliability Standard VAR-001-4 was approved by the Commission in Docket No. RD14-11-000. *See N. Am. Elec. Reliability Corp.* (Aug. 1, 2014) (unpublished letter order). The Commission approved the currently-effective errata version VAR-001-4.1 in Docket No. RD15-6-000. *See N. Am. Elec. Reliability Corp.* (Nov. 13, 2015) (unpublished letter order).

<sup>59</sup> Reliability Standard VAR-001-4.1, Guidelines and Technical Basis.

<sup>60</sup> *See* revised definition of Real-time Assessment.

008-1 and Commission-approved Reliability Standards IRO-008-2 and TOP-001-3 as discussed above. Real-time Assessments assist operators in maintaining operations within established SOLs and IROLs, to include voltage stability criteria. Under these requirements, applicable entities must use whatever analysis is necessary to obtain an evaluation of system conditions, which may include Real-time voltage stability analysis. These requirements do not prescribe the use of specific techniques or tools.

In light of the comprehensive and flexible framework that is now in place, NERC submits that the Commission's underlying concern from Order No. 693 has been addressed, and that it is no longer necessary to modify the VAR-001 Reliability Standard to specifically require the performance of voltage stability analysis using online techniques when available or offline simulation tools when not available.

#### **D. Enforceability of the Proposed Reliability Standards**

The proposed Reliability Standards contain Violation Risk Factors (“VRFs”) and Violation Severity Levels (“VSLs”). The VSLs provide guidance on the way that NERC will enforce the Requirements of the proposed Reliability Standards. The VRFs are one of several elements used to determine an appropriate sanction when the associated Requirement is violated. The VRFs assess the impact to reliability of violating a specific Requirement. The VRFs and VSLs comport with NERC and Commission guidelines related to their assignment. A description of how the proposed VRF and VSL assignments meet these guidelines is provided in **Exhibit D**. Below, NERC provides additional detail to explain how the proposed VRF assignments meet these guidelines.

Each of the Requirements in proposed Reliability Standards IRO-018-1 and TOP-010-1 were assigned a “Medium” VRF. Under NERC’s criteria for VRFs, a Medium Risk Requirement is defined as follows:

A requirement that, if violated, could directly affect the electrical state or the capability of the Bulk Electric System, or the ability to effectively monitor and control the Bulk Electric System. However, violation of a medium risk requirement is unlikely to lead to Bulk Electric System instability, separation, or cascading failures; or, a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly and adversely affect the electrical state or capability of the Bulk Electric System, or the ability to effectively monitor, control, or restore the Bulk Electric System. However, violation of a medium risk requirement is unlikely, under emergency, abnormal, or restoration conditions anticipated by the preparations, to lead to Bulk Electric System instability, separation, or cascading failures, nor to hinder restoration to a normal condition.

The Commission has set forth several guidelines for evaluating proposed VRFs.<sup>61</sup> First, for Reliability Standard Requirements addressing areas identified in the August 2003 Blackout Report as causes of previous blackouts, the Commission looks to determine whether the assigned VRFs “appropriately reflect their historical critical impact on the reliability of the Bulk Power System.” Second, the Commission looks to whether the assigned VRFs are consistent within the Reliability Standard. Third, the Commission evaluates whether the assigned VRFs are consistent among other Reliability Standards with similar Requirements. Fourth, the Commission evaluates whether the proposed VRF assignments are consistent with NERC’s definition of the VRF level. Lastly, where a single Requirement co-mingles higher and lower risk reliability objectives, the Commission evaluates whether the VRF has been “watered down” to reflect the lower risk level.

Under these guidelines, NERC’s proposed assignment of “Medium” VRFs for the proposed Reliability Standard Requirements is appropriate. First, the proposed Requirements are

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<sup>61</sup> See *N. Am. Electric Reliability Corp., Order on Violation Risk Factors*, 119 FERC ¶ 61,145 (2007).

not directly connected to the conclusions or critical areas identified in the August 2003 Blackout Report, but rather address specific recommendations from a NERC technical committee. With respect to the final guideline, the proposed VRF assignments do not reflect the lower of multiple reliability objectives as each requirement contains one reliability objective. With respect to the second, third, and fourth guidelines, the proposed VRF assignments are consistent within the proposed Reliability Standards, among other Reliability Standards with similar Requirements, and with the NERC definition of the VRF level, as discussed below.

The proposed Medium VRF assignments are consistent with the NERC definition. The purpose of the proposed Reliability Standards is to address recommendations regarding Real-time situational awareness and to require entities to take steps to address data or analysis quality concerns to the extent that it affects their ability to perform Real-time monitoring and analysis. The requirements in IRO-018-1 and TOP-010-1 address issues related to the quality and availability of monitoring and analysis capabilities used by Reliability Coordinators, Transmission Operators, and Balancing Authorities in maintaining reliable operations. Violation of any of these requirements could directly affect the ability to effectively monitor and control the Bulk Electric System. However, violation of any of these requirements is unlikely to lead to Bulk Electric System instability, separation, or cascading failures.

Further, NERC's proposed assignment of Medium VRFs is both consistent within the proposed Reliability Standards, which contain similar responsibilities for different applicable entities, and with other Reliability Standards that involve effective monitoring and control of the Bulk Electric System. For example, Reliability Standards TOP-003-3 Requirement 5 and IRO-010-2 Requirement R3, which provide that applicable entities shall provide the data necessary for Transmission Operators and Reliability Coordinators to perform Real-time monitoring and



Real-time Assessments, have each been assigned a Medium VRF. Reliability Standard TOP-001-3 Requirement R9, which requires Transmission Operators and Balancing Authorities to notify Reliability Coordinators and others of planned and unplanned outages of monitoring and assessment capabilities, has also been assigned a Medium VRF.<sup>62</sup>

In addition to the proposed VRFs and VSLs, the proposed Reliability Standards also include Measures that support each Requirement by clearly identifying what is required and how the Requirement will be enforced. These Measures help ensure that the Requirements will be enforced in a clear, consistent, and non-preferential manner and without prejudice to any party.<sup>63</sup>

#### V. **EFFECTIVE DATE**

NERC respectfully requests that the Commission approve the proposed implementation plan attached to this Petition as **Exhibit B**. NERC proposes a single implementation plan, to govern implementation of both proposed Reliability Standards IRO-018-1 and TOP-010-1. Under this plan, the proposed Reliability Standards would become effective the first day of the first calendar quarter that is 18 months following regulatory approval.

The proposed implementation period is designed to allow applicable entities sufficient time to develop and implement the required Operating Processes or Procedures and, if necessary, implement any upgrades to their Real-time monitoring systems.

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<sup>62</sup> In addition, NERC's proposed VRF assignments are appropriate in light of the Commission-approved VRF assignments for related Reliability Standards. The proposed requirements relate to implementing Operational Processes or Operational Procedures to address Real-time data quality and analysis issues. The actual Requirements to perform Real-time Assessments have been assigned a High VRF. *See, e.g.*, TOP-001-3 Requirement 13. Requirements to maintain data specifications for the data needed to perform Real-time monitoring and Real-time Assessments have been assigned a Low VRF. *See, e.g.*, TOP-003-3 Requirement R1.

<sup>63</sup> Order No. 672 at P 327 ("There should be a clear criterion or measure of whether an entity is in compliance with a proposed Reliability Standard. It should contain or be accompanied by an objective measure of compliance so that it can be enforced and so that enforcement can be applied in a consistent and non-preferential manner.").

VI. **CONCLUSION**

For the reasons set forth above, NERC respectfully requests that the Commission:

- approve proposed Reliability Standards IRO-018-1, TOP-010-1, and associated elements included in **Exhibit A**; and
- approve the implementation plan included in **Exhibit B**.

Respectfully submitted,

*/s/ Lauren A. Perotti*

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