NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Evaluation of Proposed Definitions

Project 2007-06.2 – Phase 2 of System Protection Coordination

Introduction

The following definitions are proposed for revision under the Project 2007-06.2 – Phase 2 of System Protection Coordination. The definitions of "Operating Planning Analysis" (OPA) and "Real-time Assessment" (RTA) are used in the Transmission Operations and Interconnection Reliability Operations and Coordination (TOP/IRO) sets of Reliability Standards.[1] To address the reliability objective of PRC-001-1.1(ii) – *Protection System Coordination*, Requirement R1 to "be familiar with the purpose and limitations of Protection System schemes in its area," the two definitions are being modified to include the phrase "…functions, and ~~limits~~limitations…" to ensure the Transmission Operator (TOP), ~~and Reliability Coordinator (RC) that is not applicable to PRC-001-1.1(ii),~~ consider the functions and ~~limits~~limitations of Protection Systems and Remedial Action Schemes (RAS) in their OPA and RTA evaluations. The PRC-001-1(ii) standard is not applicable to the Reliability Coordinator (RC), however, the modifications to the definitions affect this entity. Revising the definitions to require the RC and the TOP to integrate the functions and ~~limits~~limitations (i.e., purpose and limitations) into its OPA and RTA will ensure that the Bulk Electric System (BES) is operated within System Operating Limits (SOL) and Interconnection Reliability Operating Limits (IROL).

Proposed Definitions

This section includes the Reliability Standards and the associated requirements where the two modified terms are found. These two terms are not found within the proposed PER-006-1 standard, but are an integral part of the basis for the retirement of PRC-001-1.1(ii), Requirement R1. There are two significant revisions, (1) an administrative update to replace "Special Protection System" to "Remedial Action Scheme" (RAS), and (2) the addition of the phrase "…functions, and ~~limits~~limitations…" to address the reliability objective of PRC-001-1.1(ii), Requirement R1 for the applicable TOP that must integrate the "functions and ~~limits~~limitations" into these evaluations. The proposed definition ~~revision~~revisions also ~~has~~have an effect on the Reliability Coordinator that is not applicable to PRC-001-1.1(ii). The bold text in the "Proposed Definitions" column accentuate the revisions.

[1] Transmission Operations Reliability Standards and Interconnection Reliability Operations and Coordination Reliability Standards, Order No. 817, 153 FERC ¶ 61,178 (2015).

Definitions (Effective January 1, 2017)	Proposed Definitions
Operational Planning Analysis An evaluation of projected system conditions to assess anticipated (pre-Contingency) and potential (post-Contingency) conditions for next-day operations. The evaluation shall reflect applicable inputs including, but not limited to, load forecasts; generation output levels; Interchange; known Protection System and Special Protection System status or degradation; Transmission outages; generator outages; Facility Ratings; and identified phase angle and equipment limitations. (Operational Planning Analysis may be provided through internal systems or through third-party services.)	**Operational Planning Analysis (OPA)** An evaluation of projected system conditions to assess anticipated (pre-Contingency) and potential (post-Contingency) conditions for next-day operations. The evaluation shall reflect applicable inputs including, but not limited to**:** load forecasts; generation output levels; Interchange; known Protection System and **Remedial Action Scheme** status or degradation**, functions, and** ~~**limits**~~**limitations**; Transmission outages; generator outages; Facility Ratings; and identified phase angle and equipment limitations. (Operational Planning Analysis may be provided through internal systems or through third-party services.)
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 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.)	**Real-time Assessment (RTA)** 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 **Remedial Action Scheme** status or degradation**, functions, and** ~~**limits**~~**limitations;** 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.)

Evaluation

The following is an evaluation of the potential impacts the modifications to the above definitions may have on the expected performance by the RC and TOP. The evaluation is limited to the Reliability Standards that will be or become in effect upon approval of the revised definitions.

Operational Planning Analysis (OPA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-002-4 – Reliability Coordination – Monitoring and Analysis (Effective April 1, 2017) **R1.** Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments.	The OPA definition revision has an impact on the RC in this requirement. The RC must include in its data exchange capability the "functions and ~~limits~~limitations" of Protection Systems and RAS needed to perform an OPA.
IRO-008-2 - Reliability Coordinator Operational Analyses and Real-time Assessments (Effective April 1, 2017) **R1.** Each Reliability Coordinator shall perform an *Operational Planning Analysis* that will allow it to assess whether the planned operations for the next-day will exceed System Operating Limits (SOLs) and Interconnection Operating Reliability Limits (IROLs) within its Wide Area. **R2.** Each Reliability Coordinator shall have a coordinated Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) and Interconnection Reliability Operating Limit (IROL) exceedances identified as a result of its *Operational Planning Analysis* as performed in Requirement R1 while considering the Operating Plans for the next-day provided by its Transmission Operators and Balancing Authorities.	**Requirement R1** The OPA definition revision has an impact on the RC in this requirement. The RC must integrate the "functions and ~~limits~~limitations" of Protection Systems and RAS in order to assess whether the planned operations for the next-day will exceed SOLs and IROLs within its Wide Area. **Requirement R2** The OPA definition revision has no impact on the RC in this requirement. This requirement references that the results of the OPA are used by the RC to have a coordinated Operating Plan(s) for next-day operations to address potential SOL and IROL exceedances.

Operational Planning Analysis (OPA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-010-2 – Reliability Coordinator Data Specification and Collection (Effective April 1, 2017) **R1.** The Reliability Coordinator shall maintain a documented specification for the data necessary for it to perform its *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments. The data specification shall include but not be limited to: **1.1.** A list of data and information needed by the Reliability Coordinator to support its *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments including non-BES data and external network data, as deemed necessary by the Reliability Coordinator. **1.2.** Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **1.3.** A periodicity for providing data. **1.4.** The deadline by which the respondent is to provide the indicated data. **R2.** The Reliability Coordinator shall distribute its data specification to entities that have data required by the Reliability Coordinator's *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments.	**Requirement R1** The OPA definition revision has an impact on the RC in this requirement. The data needed by the RC regarding the "functions and ~~limits~~limitations" of Protection Systems and RAS to support performing an OPA would be included within Requirement R1, Part 1.1. Similarly in the most recent definition of OPA, the "status or degradation" of Protection Systems and Special Protection Systems (i.e., RAS) is addressed in its own requirement part (1.2). **Requirement R2** The OPA definition revision has no impact on the RC in this requirement. The requirement performance is to distribute the data specification that is associated with the OPA to others.

Operational Planning Analysis (OPA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-014-3 - Coordination Among Reliability Coordinators (Effective April 1, 2017) **R1.** Each Reliability Coordinator shall have and implement Operating Procedures, Operating Processes, or Operating Plans, for activities that require notification or coordination of actions that may impact adjacent Reliability Coordinator Areas, to support Interconnection reliability. These Operating Procedures, Operating Processes, or Operating Plans shall include, but are not limited to, the following: **1.1.** Criteria and processes for notifications. **1.2.** Energy and capacity shortages. **1.3.** Control of voltage, including the coordination of reactive resources. **1.4.** Exchange of information including planned and unplanned outage information to support its *Operational Planning Analyses* and Real-time Assessments. **1.5.** Provisions for periodic communications to support reliable operations.	The OPA definition revision has no impact on the RC in this requirement. Part 1.4 references that the RC must include information about planned and unplanned outages that support its OPA.

Operational Planning Analysis (OPA)	
Requirement in Approved Standard	**Description and Change Justification**
TOP-002-4 – Operations Planning (Effective April 1, 2017) **R1.** Each Transmission Operator shall have an *Operational Planning Analysis* that will allow it to assess whether its planned operations for the next day within its Transmission Operator Area will exceed any of its System Operating Limits (SOLs). **R2.** Each Transmission Operator shall have an Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) exceedances identified as a result of its *Operational Planning Analysis* as required in Requirement R1.	**Requirement R1** The OPA definition revision has an impact on the TOP in this requirement. The TOP must integrate the "functions and ~~limits~~limitations" of Protection Systems and RAS in order to assess whether its planned operations for the next day within its TOP Area will exceed any of its SOLs. **Requirement R2** The OPA definition revision has no impact on the TOP in this requirement. The TOP is using information resulting from its OPA.

Operational Planning Analysis (OPA)	
Requirement in Approved Standard	**Description and Change Justification**
TOP-003-3 – Operational Reliability Data (Effective April 1, 2017) **R1.** Each Transmission Operator shall maintain a documented specification for the data necessary for it to perform its *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments. The data specification shall include, but not be limited to: **1.1.** A list of data and information needed by the Transmission Operator to support its *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessments including non-BES data and external network data as deemed necessary by the Transmission Operator. **1.2.** Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **1.3.** A periodicity for providing data. **1.4.** The deadline by which the respondent is to provide the indicated data. **R3.** Each Transmission Operator shall distribute its data specification to entities that have data required by the Transmission Operator's *Operational Planning Analyses*, Real-time monitoring, and Real-time Assessment.	**Requirement R1** The OPA definition revision has an impact on the TOP in this requirement. The data needed by the TOP regarding the "functions and ~~limits~~limitations" of Protection Systems and RAS to support performing an OPA would be included within Requirement R1, Part 1.1. Similarly in the most recent definition of OPA, the "status or degradation" of Protection Systems and Special Protection Systems (i.e., RAS) is addressed in its own requirement part (1.2.). **Requirement R2** The OPA definition revision has no impact on the RC in this requirement. The requirement performance is to distribute the data specification that is associated with the OPA to others.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-002-4 – Reliability Coordination – Monitoring and Analysis (Effective April 1, 2017) **R1.** Each Reliability Coordinator shall have data exchange capabilities with its Balancing Authorities and Transmission Operators, and with other entities it deems necessary, for it to perform its Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments*.	The RTA definition revision has an impact on the RC in this requirement. The RC must include in its data exchange capability the "functions and ~~limits~~limitations" of Protection Systems and RAS needed to perform an RTA.
IRO-008-2 – Reliability Coordinator Operational Analyses and Real-time (Effective April 1, 2017) **R4.** Each Reliability Coordinator shall ensure that a *Real-time Assessment* is performed at least once every 30 minutes. **R5.** Each Reliability Coordinator shall notify impacted Transmission Operators and Balancing Authorities within its Reliability Coordinator Area, and other impacted Reliability Coordinators as indicated in its Operating Plan, when the results of a *Real-time Assessment* indicate an actual or expected condition that results in, or could result in, a System Operating Limit (SOL) or Interconnection Reliability Operating Limit (IROL) exceedance within its Wide Area.	**Requirement R4** The RTA definition revision has an impact on the RC in this requirement. The RC must include the "functions and ~~limits~~limitations" among other prescribed inputs from the definition of RTA. **Requirement R5** The RTA definition revision has no impact on the RC in this requirement. The RC is notifying others based on the results of its RTA that an actual or expected condition that results in, or could result in, a SOL or IROL exceedance within its Wide Area.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-009-2 - Reliability Coordinator Actions to Operate Within IROLs (Effective January 1, 2016) **R2.** Each Reliability Coordinator shall initiate one or more Operating Processes, Procedures, or Plans (not limited to the Operating Processes, Procedures, or Plans developed for Requirement R1) that are intended to prevent an IROL exceedance, as identified in the Reliability Coordinator's Real-time monitoring or *Real-time Assessment*. **R3.** Each Reliability Coordinator shall act or direct others to act so that the magnitude and duration of an IROL exceedance is mitigated within the IROL's T_v, as identified in the Reliability Coordinator's Real-time monitoring or *Real-time Assessment*.	**Requirement R2** The RTA definition revision has no impact on the RC in this requirement. The RC will be taking an action to prevent an IROL exceedance, as identified in the RC's RTA. **Requirement R3** The RTA definition revision has no impact on the RC in this requirement. The RC will be acting or directing others so that the magnitude and duration of an IROL exceedance is mitigated within the IROL's T_v, as identified in the RC's RTA.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-010-2 – Reliability Coordinator Data Specification and Collection (Effective April 1, 2017) **R1.** The Reliability Coordinator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments*. The data specification shall include but not be limited to: **1.1.** A list of data and information needed by the Reliability Coordinator to support its Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments* including non-BES data and external network data, as deemed necessary by the Reliability Coordinator. **1.2.** Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **1.3.** A periodicity for providing data. **1.4.** The deadline by which the respondent is to provide the indicated data. **R2.** The Reliability Coordinator shall distribute its data specification to entities that have data required by the Reliability Coordinator's Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments*.	**Requirement R1** The RTA definition revision has an impact on the RC in this requirement. The data needed by the RC regarding the "functions and ~~limits~~limitations" of Protection Systems and RAS to support performing an RTA would be included within Requirement R1, Part 1.1. Similarly in the most recent definition of RTA, the "status or degradation" of Protection Systems and Special Protection Systems (i.e., RAS) is addressed in its own requirement part (1.2.). **Requirement R2** The RTA definition revision has no impact on the RC in this requirement. The requirement performance is to distribute the data specification that is associated with the RTA to others.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
IRO-014-3 - Coordination Among Reliability Coordinators (Effective April 1, 2017) **R1.** Each Reliability Coordinator shall have and implement Operating Procedures, Operating Processes, or Operating Plans, for activities that require notification or coordination of actions that may impact adjacent Reliability Coordinator Areas, to support Interconnection reliability. These Operating Procedures, Operating Processes, or Operating Plans shall include, but are not limited to, the following: **1.1.** Criteria and processes for notifications. **1.2.** Energy and capacity shortages. **1.3.** Control of voltage, including the coordination of reactive resources. **1.4.** Exchange of information including planned and unplanned outage information to support its Operational Planning Analyses and *Real-time Assessments*. **1.5.** Provisions for periodic communications to support reliable operations.	The RTA definition revision has no impact on the RC in this requirement. Part 1.4 references that the RC must include information about planned and unplanned outages that support its RTA.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
TOP-001-3 – Transmission Operations (Effective April 1, 2017) **R13.** Each Transmission Operator shall ensure that a *Real-time Assessment* is performed at least once every 30 minutes. **R14.** Each Transmission Operator shall initiate its Operating Plan to mitigate a SOL exceedance identified as part of its Real-time monitoring or *Real-time Assessment*.	**Requirement R13** The RTA definition revision has an impact on the TOP in this requirement. The TOP must include the "functions and ~~limits~~limitations" among the other prescribed inputs from the definition of RTA. **Requirement R14** The RTA definition revision has no impact on the TOP in this requirement. The TOP will be initiating its Operating Plan to mitigate a SOL exceedance identified in its RTA.

Real-time Assessment (RTA)	
Requirement in Approved Standard	**Description and Change Justification**
TOP-003-3 – Operational Reliability Data (Effective April 1, 2017) **R1.** Each Transmission Operator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments*. The data specification shall include, but not be limited to: **1.1.** A list of data and information needed by the Transmission Operator to support its Operational Planning Analyses, Real-time monitoring, and *Real-time Assessments* including non-BES data and external network data as deemed necessary by the Transmission Operator. **1.2.** Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **1.3.** A periodicity for providing data. **1.4.** The deadline by which the respondent is to provide the indicated data. **R3.** Each Transmission Operator shall distribute its data specification to entities that have data required by the Transmission Operator's Operational Planning Analyses, Real-time monitoring, and *Real-time Assessment*.	**Requirement R1** The RTA definition revision has an impact on the TOP in this requirement. The data needed by the TOP regarding the "functions and ~~limits~~limitations" of Protection Systems and RAS to support performing an RTA would be included within Requirement R1, Part 1.1. Similarly in the most recent definition of RTA, the "status or degradation" of Protection Systems and Special Protection Systems (i.e., RAS) is addressed in its own requirement part (1.2.). **Requirement R2** The RTA definition revision has no impact on the RC in this requirement. The requirement performance is to distribute the data specification that is associated with the RTA to others.