Project 2014-03 - Revision of TOP/IRO Reliability Standards

Resolution of Issues and Directives

The following table contains a list of all FERC directives, industry issues, and Independent Expert Review Panel (IERP) recommendations associated with the standards being revised in Project 2014-03, with proposed resolutions.

Standard	Source	Language	Resolution
IRO-001-3	FERC Order 693	892. Consider commenters' suggestions as part of the standards development process. APPA supports the approval of the Reliability Standard but expresses concern that the Version 1 standard does not include Measures that correspond to Requirements R2 and R9. APPA emphasizes the need for Measures corresponding to Requirement R9, which requires the reliability coordinator to act in the interests of reliability for the overall reliability coordinator area and the Interconnection before the interests of any other entity. APPA supports Requirement R8 with the extended applicability, provided that applicability is determined by reference to the NERC compliance registry. APPA agrees that the regional reliability organization should be eliminated as an applicable entity and suggests it be replaced with Regional Entities.	The SDT has added measures for all requirements. The Regional Reliability Organization has been removed from the standards.
IRO-001-3	FERC Order 693	893. Consider commenters' suggestions as part of the standards development process. FirstEnergy	The SDT has considered the commenter's suggestions and believes that safety refers to any

Standard	Source	Language	Resolution
		suggests that NERC clarify whether Requirement R8, which requires entities to comply with a reliability coordinator directive "unless such actions would violate safety, equipment or regulatory or statutory requirements," refers to personnel safety, equipment safety or both. In addition, it suggests the establishment of a chain of command so that, for example, if a generator receives conflicting instructions from a balancing authority and a transmission operator, it can determine which instruction governs.	type of safety including personal or equipment and that no additional wording is necessary. If a generator receives conflicting Operating Instructions, the generator should contact the Reliability Coordinator for clarification. The NERC Functional model refers to the Reliability Coordinator as overall authority.
IRO-001-3	FERC Order 693	895. California Cogeneration comments that the Reliability Standard fails to address the operational limitations of QFs because they have contractual obligations to provide thermal energy to their industrial hosts. It contends that a QF can be directed to change operations only in the case of a system emergency, pursuant to 18 CFR § 292.307.	The SDT has considered the comments and believes that a Reliability Coordinator can direct a Qualifying Facility (registered as a GO or GOP) to act through the issuance of Operating Instructions. Therefore, no additional requirements are necessary.
IRO-001-3	FERC Order 693	896. Eliminate the references to the regional reliability organization as an applicable entity. Paragraph 896. In the NOPR, the Commission proposed to approve the Reliability Standard as mandatory and enforceable. In addition, as a separate action under section 215(d)(5), the NOPR proposed to direct the ERO to develop modifications to Requirement R1 to substitute "Regional Entity" for "regional reliability organization" and reflect	The SDT has removed all references to the Regional Reliability Organization from the standards.

Standard	Source	Language	Resolution
		NERC's Rules of Procedure for registering, certifying and verifying entities, including reliability coordinators. Commenters do not raise any concerns regarding the proposed action. Accordingly, for the reasons stated in the NOPR, the Commission approves IRO-001-1 as mandatory and enforceable. In addition, for the reasons discussed in the NOPR, the Commission directs the ERO to develop modifications to the Reliability Standard through the Reliability Standards development process that reflect the process set forth in the NERC Rules of Procedures and eliminate the regional reliability organization as an applicable entity.	
IRO-001-3	FERC Order 693	897. Consider adding measures and levels of non-compliance. Further, the Commission directs the ERO to consider adding Measures and Levels of Non-Compliance in the Reliability Standard as requested by APPA.	The SDT has added measures and Violation Severity levels (VSLs) (which replaced levels of non-compliance) for each requirement.
IRO-001-3	FERC's December 20, 2007 and April 4, 2008 Orders	On March 4, 2008, NERC submitted a compliance filing in response to a December 20, 2007 Order, in which the Commission reversed a NERC decision to register three retail power marketers to comply with Reliability Standards applicable to load serving entities (LSEs) and directed NERC to submit a plan describing how it would address a possible "reliability gap" that NERC asserted would result if the LSEs were not registered. NERC's compliance	The SDT has established requirements that apply to the Load-Serving Entity. **Proposed TOP-001-3, Requirement R3**: **R3.** Each Balancing Authority, Generator Operator, and Distribution Provider shall comply with each Operating Instruction issued by its Transmission Operator(s), unless such action cannot be

Standard	Source	Language	Resolution
		filing included the following proposal for a short-term plan and a long-term plan to address the potential gap: Short-term: Using a posting and open comment process, NERC will revise the registration criteria to define "Non-Asset Owning LSEs" as a subset of Load Serving Entities and will specify the reliability standards applicable to that subset. · Longer-term: NERC will determine the changes necessary to terms and requirements in reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers and process them through execution of the three-year Reliability Standards Development Plan. In this revised Reliability Standards Development Plan, NERC is commencing the implementation of its stated long-term plan to address the issues surrounding accountability for loads served by retail marketers/suppliers. The NERC Reliability Standards Development Procedure will be used to identify the changes necessary to terms and requirements in reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers. Specifically, the following description has been	physically implemented or it would violate safety, equipment, regulatory, or statutory requirements.

Standard	Source	Language	Resolution
		incorporated into the scope for affected projects in this revised Reliability Standards Development Plan that includes a standard applicable to Load Serving Entities: Source: FERC's December 20, 2007 Order in Docket Nos. RC07-004-000, RC07-6-000, and RC07-7-000 Issue: In FERC's December 20, 2007 Order, the Commission reversed NERC's Compliance Registry decisions with respect to three load serving entities in the Reliability First (RFC) footprint. The distinguishing feature of these three LSEs is that none own physical assets. Both NERC and RFC assert that there will be a "reliability gap" if retail marketers are not registered as LSEs. To avoid a possible gap, a consistent, uniform approach to ensure that appropriate Reliability Standards and associated requirements are applied to retail marketers must be followed. Each drafting team responsible for reliability standards that are applicable to LSEs is to review and change as necessary, requirements in the reliability standards to address the issues surrounding accountability for loads served by retail marketers/suppliers. For additional information see: · FERC's December 20, 2007 Order (http://www.nerc.com/files/LSE_decision_order.pdf)	

Standard	Source	Language	Resolution
		· NERC's March 4, 2008 (http://www.nerc.com/files/FinalFiledLSE3408.pdf), · FERC's April 4, 2008 Order (http://www.nerc.com/files/AcceptLSECompFiling-040408.pdf), and · NERC's July 31, 2008 (http://www.nerc.com/files/FinalFiled-CompFiling-LSE-07312008.pdf) compliance filings to FERC on this subject.	
IRO-001-3	Fill in the Blank Team	Remove ", sub-region, or interregional coordinating group" from R1	Terms have been removed from the standard.
IRO-001-3	Version 0 Team	Inability to perform needs to be communicated	Clarity has been provided to address this issue throughout the various standards.
IRO-001	Version 0 Team	What is meant by 'interest of other entity'?	The SDT proposes to retire Requirement R9. All Reliability Coordinator Standard Requirements are developed so that the Reliability Coordinator shall act in the interest of reliability for the Reliability Coordinator Area and the Interconnection.
IRO-001-3	Fill in the Blank Team	Consider removing "Standards of conduct are necessary to ensure the Reliability Coordinator does not act in a manner that favors one market	The purpose statement has been revised accordingly.

Standard	Source	Language	Resolution
		participant over another." from the Purpose section of the standard.	Purpose: To establish the responsibility of Reliability Coordinators to act or direct other entities to act to prevent an Emergency.
IRO-001-3	NERC Audit Observation Team	All applicable registered functions shall comply with RC directives unless such actions would violate safety, equipment or regulatory or statutory requirements. Inform the RC immediately of the inability to perform such directives. For audit purposes, what is acceptable evidence?	Measure M2 contains the provisions for suitable evidence. **Proposed IRO-001-4, Measure M2**: **M2**. Each Transmission Operator, Balancing Authority, Generator Operator, and Distribution Provider shall have and provide evidence which may include, but is not limited to dated operator logs, dated records, dated and time-stamped voice recordings or dated transcripts of voice recordings, electronic communications, or equivalent documentation, that will be used to determine that it complied with its Reliability Coordinator's Operating Instruction, unless the instruction could not be physically implemented, or such actions would have violated safety, equipment, regulatory or statutory requirements. In such cases, the Transmission Operator, Balancing Authority, Generator Operator, or Distribution Provider shall have and provide copies of the safety, equipment, regulatory, or statutory requirements as evidence for not complying with the Reliability Coordinator's Operating Instruction. If no event has occurred, the Transmission Operator, Balancing Authority, Generator Operator, or

Standard	Source	Language	Resolution
			Distribution Provider may provide an attestation that an event has not occurred.
IRO-001-3	VRFs Team	R6 - Since the RC must be NERC certified, it stands to reason that anyone performing RC tasks should be certified. However, since the RC still retains the accountability for actions, and requirement 4 handles the agreements, this requirement is a medium risk.	The SDT is proposing to retire this requirement. The Reliability Coordinator may delegate tasks but cannot delegate the responsibility for these tasks. Therefore, it is not necessary to mandate that delegated tasks must be carried out by certified personnel as it is the responsibility of the Reliability Coordinator to ensure that the task is carried out.
IRO-001-3	IERP	Requirement R1 content is incomplete. IERP recommended addressing 3 concepts as follows: RC has the authority to direct others to act. RC has the obligation to direct others to act to prevent identified events or mitigate the magnitude or duration of actual events that result in an Emergency or Adverse Reliability Impact.	The NERC Functional Model v5 spells out the authority of the Reliability Coordinator on page 30 under the description of the Reliability Coordinator functional entity. Proposed IRO-001-4, Requirement addresses the obligation of the Reliability Coordinator to direct others to act. **Proposed IRO-001-4, Requirement R1**: **R1**. Each Reliability Coordinator shall act to address the reliability of its Reliability Coordinator Area via direct actions or by issuing Operating Instructions. The term 'Reliability Directive' has been replaced with the defined term 'Operating Instruction.' Proposed COM-002-4 determines the protocol for issuing Operating Instructions.

Standard	Source	Language	Resolution
		When directing others to act in accordance with this requirement, a RC must identify its directive as a "Reliability Directive". Consider consolidating with other authority-related standards and COM-003 in a single Authority standard as follows: Each Reliability Coordinator, Transmission Operator and Balancing Authority shall have the requirement and authority to take actions, including issuing a Reliability Directive, to prevent, mitigate and respond to an Emergency or Adverse Reliability Impact.	The SDT believes that a separate authority standard is not necessary. Existing standards and requirements in conjunction with the Functional Model v5 are sufficient to address the authority issue raised here.
IRO-001-3	IERP	IERP viewed Requirement R2 language as unclear and unable to be practically implemented. Questioned whether equipment requirements were a valid reason for not complying with RC direction. IERP proposed covering this requirement under a single Authority standard as follows: Each Transmission Operator, Balancing Authority, Generator Operator, and Distribution Provider shall comply with directions from a Reliability Coordinator, Transmission Operator or Balancing Authority under R1 unless it communicates to the RC, TOP or BA that it cannot because the direction cannot be physically implemented or unless such actions would violate	The SDT does not agree with the IERP statement/suggestion. The SDT feels this is more of a compliance issue and should not be addressed in Real-time.

Standard	Source	Language	Resolution
		safety, equipment, regulatory, or statutory requirements.	
IRO-001-3	IERP	IERP viewed content of Requirement R3 as incomplete by not requiring a reason for not complying with the RC's direction IERP recommended consolidating into a single Authority standard (see requirement above, which would replace both IRO-001 requirements R2 and R3)	The SDT does not agree with the IERP statement/suggestion. The SDT feels this is more of a compliance issue and should not be addressed in Real-time.
IRO-002-1	FERC Order 693	905 - Require a minimum set of tools that must be made available to the reliability coordinator. 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 that this requirement will ensure that a reliability coordinator has the tools it needs to perform its functions.	This directive is beyond the scope of this project and will be resolved in a future project.
IRO-002	Version 0 Team	R5 – define synchronized information system	The term is not used in the revised standards.
IRO-002	Version 0 Team	R7 – define 'adequate' tools and 'wide-area'	The terms are not used in the revised standards
IRO-002-1	Version 0 Team	Words such as 'easily understood' and 'particular emphasis' need to be tightened	The terms are not used in the revised standards
IRO-002-3	IERP	IERP viewed Requirement R1 as incomplete. RC also needs to approve any other work being done on the tools, hardware/software/telecom systems within the RC that could affect the quality and the content of the data coming into the control center.	Proposed IRO-002-4, Requirement R2 addresses this issue. **Proposed IRO-002-4, Requirement R2**: **R2**. Each Reliability Coordinator shall provide its System Operators with the authority to approve

Standard	Source	Language	Resolution
			planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.
		Also consider consolidating with Project 2009-02	The Project 2014-03 SDT is addressing directives assigned to Project 2009-02 as well as issues identified in the NOPR on the TOP/IRO standards.
		Requirement R1 was proposed for consolidation under a new Authority standard: Authority R2 Each RC, TOP and BA shall have the requirement and authority to approve, deny or cancel planned outages of its EMS, telecom and other hardware, and associated analysis tools.	The SDT believes that a separate authority standard is not necessary. Existing standards and requirements in conjunction with the Functional Model v5 are sufficient to address the authority issue raised here.
IRO-002-3	IERP	IERP viewed Requirement R2 as incomplete. Procedures need to address not only tools outages, but also tools maintenance or other inhibitors to quality performance of analysis tools.	The SDT added 'maintenance' approval to proposed IRO-002-3, Requirement R3. This includes all work being done on monitoring and analysis capabilities and not just those that will cause an outage.
		Also consider consolidating with Project 2009-02	**Proposed IRO-002-4, Requirement R2**: **R2.** Each Reliability Coordinator shall provide its System Operators with the authority to approve planned outages and maintenance of its telecommunication, monitoring and analysis capabilities.

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			The Project 2014-03 SDT is addressing directives assigned to Project 2009-02 as well as issues identified in the NOPR on the TOP/IRO standards.
IRO-003	Order 693	914. … we adopt in the Final Rule the proposal to direct that the ERO develop a modification to the Reliability Standard through the Reliability Standards development process to create criteria to define the term "critical facilities" in a reliability coordinator's area …	The term is not used in the revised standards. The proposed data specification concept allows for the Reliability Coordinator to ask for any reliability related data that it needs in order to fulfill its reliability tasks thus obviating the need for a specific criteria for determining critical facilities. And specific requirements for monitoring have been added for the Reliability Coordinator. **Proposed IRO-010-2, Requirement R1:** **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. **Proposed IRO-002-4, Requirement R3:** **R3**. Each Reliability Coordinator shall monitor Facilities, the status of Special Protection Systems, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
IRO-004-1	Order 693	934. In response to APPAs concern that NERC did not provide a Measure for each Requirement, we reiterate that it is in the EROs discretion whether each	Measures have been added to all requirements.

Standard	Source	Language	Resolution
		Requirement requires a corresponding Measure. The ERO should consider this issue through the Reliability Standards development process.	
IRO-004-1	Order 693	935. …direct the ERO to modify IRO-004-1 through the Reliability Standards development process to require the next-day analysis to identify control actions that can be implemented and effective within 30 minutes after a contingency	The SDT has addressed this issue in proposed IRO-008-2 and TOP-002-4 as well as through the revised definitions of Operational Planning Analysis and Real-time Assessment. SOLs must be controlled according to the Operating Plan which is set up on time-based facility ratings (see SOL Exceedance White Paper for further details). IROLs are controlled to the IROL T_V which by definition is always less than 30 minutes. Approved IRO-009-1, Requirement R1 also addresses this item. **Proposed Definition: 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 may 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.)

Standard	Source	Language	Resolution
			Proposed Definition: 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 may 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.) **Proposed IRO-008-2, Requirement R1**: **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. **Proposed IRO-008-2, Requirement R2**: **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.

Standard	Source	Language	Resolution
			Proposed TOP-002-4, Requirement R1: **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). **Proposed TOP-002-4, Requirement R2**: **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. **Proposed IRO-009-1, Requirement R1**: **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies one or more days prior to the current day, the Reliability Coordinator shall have one or more Operating Processes, Procedures, or Plans that identify actions it shall take or actions it shall direct others to take (up to and including load shedding) that can be implemented in time to prevent exceeding those IROLs.
IRO-005	FERC Order 693	520. Further, we clarify that we did not propose to require an entity to inform its reliability coordinator of every action it takes. Instead, the proposed directive included a Requirement for the reliability coordinator to assess and approve only those actions that have	The SDT addresses the need for Reliability Coordinator assessment and approval on a requirement by requirement basis. For example, see proposed IRO-008-2, Requirements R3 and R6.

Standard	Source	Language	Resolution
		impacts beyond the area views of transmission operators and balancing authorities. We remain convinced that it is the reliability coordinator's responsibility to ensure Reliable Operation of its reliability coordinator area. The reliability coordinator must also ensure that actions taken by operating entities under its authority will not have wide-area impacts that would adversely impact Reliable Operation of the Bulk-Power System. Therefore, we adopt the proposed directive as stated in the NOPR. 525. Accordingly, we direct the ERO to include a Requirement for the reliability coordinator to assess and approve actions that have impacts beyond the area views of transmission operators or balancing authorities, including how to determine whether an action needs to be assessed by the reliability coordinator. This Requirement is best developed under the Reliability Standards development process including the consideration whether this Requirement should be included in this communications Reliability Standard or an operating Reliability Standard.	**Proposed IRO-008-2, Requirement R2**: **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. **Proposed IRO-008-2, Requirement R5**: **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.
IRO-005-1	FERC Order 693	946. "Conduct a survey on IROL practices and actual operating experiences by requiring reliability coordinators to report any violations of IROLS, their causes, the date and time, the durations and magnitudes in which actual operations exceeds IROLs to NERC.	Completed and filed in Oct 2008
IRO-005-1	FERC Order 693	950- Provide further clarification that reliability coordinators and transmission operators direct control	The SDT has proposed IRO-001-4, Requirement R1 to address the Commission's suggestion for

Standard	Source	Language	Resolution
		actions, not LSEs as part of the standard development process. We do not share TAPS' concern regarding LSEs initiating load shedding as their own control action to respect IROLs or SOLs. The appropriate control actions to respect IROLs and SOLs are the responsibilities of a reliability coordinator and transmission operator. If load shedding is required, it is the responsibility of a reliability coordinator or a transmission operator to direct the appropriate entities including LSEs to carry it out. However, we urge the ERO to provide further clarification in this regard and include TAPS' concern in developing the modification of this Reliability Standard.	clarification. Proposed TOP-001-4, Requirement R1 also addresses this issue. **Proposed IRO-001-4, Requirement R1**: **R1**. Each Reliability Coordinator shall act to address the reliability of its Reliability Coordinator Area via direct actions or by issuing Operating Instructions. **Proposed TOP-001-4, Requirement R1:** **R1.** Each Transmission Operator shall act to address the reliability of its Transmission Operator Area via direct actions or by issuing Operating Instructions.
IRO-005-1	FERC Order 693	951-"Measures and levels of non-compliance specific to IROL violations must be commensurate with the magnitude, duration, frequency, and causes of the violations and whether these occur during normal or contingency conditions. Accordingly, the Commission approves Reliability Standard IRO-005-1 as mandatory and enforceable. Further, because IRO-005-1 has no Measures or Levels of Non-Compliance, pursuant to section 215(d)(5) of the FPA and § 39.5(f) of our regulations, the Commission directs the ERO to develop a modification to IRO-005-1through the Reliability Standards development process that includes Measures and Levels of Non-Compliance. The Commission further directs that the Measures and Levels of Non-Compliance specific to IROL violations must be commensurate with the magnitude, duration,	The SDT has added measures and VSLs (which replaced levels of non-compliance) for each requirement.

Standard	Source	Language	Resolution
		frequency and causes of the violations and whether these occur during normal or contingency conditions.	
IRO-005-1	Fill in the Blank Team	R14 has regional reference	The term is not used in the revised standards.
IRO-005-1	Version 0 Team	R10, 11 & 12 – RA not empowered to do this	RA is no longer an applicable entity in the revised standards.
IRO-005-4	IERP	Requirement R1 is incomplete--needs to include Emergency. Requirement R1 reads: When the results of an Operational Planning Analysis or Real-time Assessment indicate an anticipated or actual condition with Adverse Reliability Impacts within its Reliability Coordinator Area, each Reliability Coordinator shall notify all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area. Also - there are gaps between the old std IRO-005-3 R2 to IRO-005-4: missing is: There is a possible gap for RC in IRO-005-4 regarding RC handling emergencies as this has been dropped from IRO-005-3.1 Each Reliability Coordinator shall monitor its Balancing Authorities' parameters to ensure that the required amount of operating reserves is provided and available as required to meet the Control Performance Standard	The SDT replaced Adverse Reliability Impact with Emergency in all requirements. Emergency is a broader term. Proposed IRO-002-4, Requirement R3 addresses the issue of monitoring. **Proposed IRO-002-4, Requirement R3**:

Standard	Source	Language	Resolution
		and Disturbance Control Standard requirements. (Minus strikethrough) FROM IRO-005-3 R9: Whenever a Special Protection System that may have an inter-Balancing Authority, or inter-Transmission Operator impact (e.g., could potentially affect transmission flows resulting in a SOL or IROL violation) is armed, the Reliability Coordinators shall be aware of the impact of the operation of that Special Protection System on inter-area flows.	**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. The SDT believes all appropriate items, including Special Protection System evaluation and awareness is addressed through the revised definitions of Real-time Assessment and Operations Planning Analysis. The data specification has been revised to explicitly address Special Protection Systems. **Proposed: 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 may 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.)

Standard	Source	Language	Resolution
			Proposed: 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 may 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.) **Proposed IRO-010-2, Requirement R1, Part 1.2:** **R1. Part 1.2** Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability.
		From IRO-005-3 R10: In instances where there is a difference in derived limits, the Transmission Operators, Balancing Authorities, Generator Operators, Transmission Service Providers, Load-Serving Entities, and Purchasing-Selling Entities shall always operate the Bulk Electric System to the most limiting parameter.	The SDT has addressed the issue of resolving differences in limits in proposed TOP-001-3, Requirement R18. **Proposed TOP-001-3, Requirement R18**: **R18.** Each Transmission Operator shall operate to the most limiting parameter in instances where there is a difference in SOLs.

Standard	Source	Language	Resolution
		Recommend consolidating with IRO-008 R3.	The SDT has consolidated requirements and standards as it believes appropriate.
IRO-005-4	IERP	The proposed standard creates a gap in outage coordination by proposing to retire IRO-005-3 R6. This could be resolved through an Authority standard as proposed by the IERP From IRO-005-3 R6: The Reliability Coordinator shall coordinate pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in both the real time and next-day reliability analysis timeframes.	The SDT has proposed a new standard, IRO-017-1 Outage Coordination, to address this issue.
IRO-005-4	IERP	Requirement R2 should also include Emergency Requirement R2 reads: Each Reliability Coordinator that identifies an anticipated or actual condition with Adverse Reliability Impacts within its Reliability Coordinator Area shall notify all impacted Transmission Operators and Balancing Authorities in its Reliability Coordinator Area when the problem has been mitigated. Note: there is a possible gap for RC in IRO-005-4 regarding RC handling emergencies as this has been dropped from IRO-005-3.1	The SDT replaced Adverse Reliability Impact with Emergency in all requirements for consistency. The definition of Adverse Reliability Impact is encompassed in Emergency.

Standard	Source	Language	Resolution
		Recommend moving to IRO-008 and create an R4	
IRO-014-2	IERP	Gap in Requirement R1 - Need to identify RC's authority to direct another RC to take action - suggestion: create another Requirement, i.e., R6 (in proposed authority standard). Each RC shall comply with directions from another RC under R1 unless it communicates to the other RC that it cannot because compliance with the direction cannot be physically implemented or unless such actions would violate safety, equipment, regulatory, or statutory requirements.	The SDT does not agree with this recommendation. A Reliability Coordinator does not direct another Reliability Coordinator. Proposed IRO-014-3 describes how to coordinate between Reliability Coordinators.
IRO-014-2	IERP	R2 is administrative and should be deleted	The SDT believes that this is not strictly an administrative requirement and serves a reliability purpose.
IRO-014-2	IERP	R3 implements plan from R1; it should be combined with R1	The SDT believes that combining the requirements would create a complex requirement with multiple objectives that would be difficult to measure for compliance.
IRO-014-2	IERP	Requirement R4 is administrative and should be deleted.	The SDT believes that this is not strictly an administrative requirement and serves a reliability purpose.
IRO-014-2	IERP	R5 should require notification of “all IMPACTED RCs"; not "ALL"	The SDT has added ‘impacted’ to appropriate locations in the standards.
IRO-014-2	IERP	R6 should be consolidated with other standards that incorporate the concept of operating to the most conservative for reliability - IRO-009-1 R5	Approved IRO-009-1 only addresses IROLs. Proposed IRO-014-3 addresses all limits.

Standard	Source	Language	Resolution
		R6 reads: During each instance where Reliability Coordinators disagree on the existence of an Adverse Reliability Impact each impacted Reliability Coordinator shall operate as though the problem exists.	
IRO-014-2	IERP	Requirement R7 should be retired. The reliability objective is covered under R6, and also supported by IRO-009-1 R5	The SDT believes that the two requirements are sufficiently distinct to warrant separateness. Requirement R6 speaks to actual operations. Requirement R7 speaks to having an established plan. The SDT believes that reliability is best served by having a plan to follow.
IRO-014-2	IERP	Requirement R8 should be retired. The reliability objective is covered under R6.	The SDT does not agree with this recommendation. Requirement R8 is a separate requirement.
IRO-016	VRF's Team	R1.2.1 & R2 – ambiguous	Requirement R2 was approved for retirement by FERC effective January 2014. Requirement R1, part 1.2.1 was incorporated in the set of requirements in proposed IRO-014-3, and ambiguous language has been deleted.
TOP-001-1	FERC Order 693	1580 - Consider adding other measures and levels of non-compliance.	Measures and VSLs have been assigned to all requirements.
TOP-001-1	FERC Order 693	1585 - Clarify the definition of “emergency” and define the criteria for entering into the various states. Also define the authority for declaring these states.	The SDT feels that the TOP-001 standard should be restricted to Transmission System operations and that definition of operating states more correctly belong in EOP-001 as pointed out in Order 693, paragraph 560. To make certain that the issue is handled there, the SDT has entered an official item in

Standard	Source	Language	Resolution
			the NERC database of project issues in this regard. This will require the SDT working on revisions to EOP-001 to formally address this concern. EOP-001 is listed in the Reliability Standards Development Plan under Project 2009-03.
TOP-001-1	FERC Order 693	1588 - Consider Santa Clara's comments to provide that the transmission operator may notify the reliability coordinator or the balancing authority that it is removing facilities from service as part of the standards development process.	This concern is addressed in proposed TOP-001-3, Requirement R8. **Proposed TOP-001-3, Requirement R8**: **R8.** Each Transmission Operator shall inform its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of its actual or expected operations that result in, or could result in, an Emergency.
TOP-001-1	Version 0 Team	What is 'clear decision making authority'?	The term is not used in the revised standards
TOP-001-1	Version 0 Team	Need to define single, central communications point during emergencies	This is an issue for COM standards.
TOP-001-1	Version 0 Team	Some emergencies will require follow up notification as opposed to immediate	Requirements have been revised to eliminate confusion.
TOP-001-1	Version 0 Team	Define emergency	The SDT feels that the TOP-001 standard should be restricted to Transmission System operations and that definition of operating states more correctly belong in EOP-001 as pointed out in Order 693, paragraph 560. To make certain that the issue is handled there, the SDT has entered an official item in the NERC database of project issues in this regard. This will require the SDT working on revisions to EOP-001 to formally address this concern. EOP-001 is

Standard	Source	Language	Resolution
			listed in the Reliability Standards Development Plan under Project 2009-03.
TOP-001-1	Version 0 Team	Need to expand included entities	Applicability has been reviewed by the SDT and changed as required.
TOP-001-2	IERP	Requirement R1 phrase "unless it violates requirements" is too permissive or there may be a better way to phrase it Consider consolidating TOP-001-2 Requirements R1 and R2 and all other standards requirements related Authority to into a single Authority standard as follows: Each Transmission Operator, Balancing Authority, Generator Operator, and Distribution Provider shall comply with directions from a Reliability Coordinator, Transmission Operator or Balancing Authority under [Authority standard R1] unless it communicates to the RC, TOP or BA that it cannot because the direction cannot be physically implemented or unless such actions would violate safety, equipment, regulatory, or statutory requirements.	The SDT believes that this is well understood language. The SDT believes that a separate authority standard is not necessary. Existing standards and requirements in conjunction with the Functional Model v5 are sufficient to address the authority issue raised here.
TOP-001-2	IERP	The language “emergency assistance” in Requirement R4 is unclear. When and how must assistance be rendered, and what type? BA’s should be included as functional entity. Consider moving R4 to EOP standards (this is an "emergency" operating requirement)	The SDT revised the language for clarity and included the Balancing Authority. **Proposed TOP-001-3, Requirement R7:** **R7**. Each Transmission Operator shall assist other Transmission Operators within its Reliability Coordinator Area, if requested and able, provided that the requesting Transmission Operator has implemented its comparable Emergency procedures,

Standard	Source	Language	Resolution
			unless such assistance cannot be physically implemented or would violate safety, equipment, regulatory, or statutory requirements.
TOP-001-2	IERP	Requirement R5 should also include notification of Emergencies (in addition to ARI), and should include Bas. R5 states: Each Transmission Operator shall inform its Reliability Coordinator and other Transmission Operators of its operations known or expected to result in an Adverse Reliability Impact on those respective Transmission Operator Areas unless conditions do not permit such communications. Examples of such operations are relay or equipment failures, and changes in generation, Transmission, or Load.	The SDT added impacted Balancing Authorities. The SDT replaced Adverse Reliability Impact with Emergency in all requirements for consistency. The definition of Adverse Reliability Impact is encompassed in Emergency. **Proposed TOP-001-3, Requirement R8:** **R8**. Each Transmission Operator shall inform its Reliability Coordinator, known impacted Balancing Authorities, and known impacted Transmission Operators of its actual or expected operations that result in, or could result in, an Emergency.
TOP-001-2	IERP	R6 needs to include real time outages of telecom as well as planned outages.	The SDT added telecommunications to the requirement. **Proposed TOP-001-2, Requirement R9:** **R9**. Each Balancing Authority and Transmission Operator shall notify its Reliability Coordinator and known impacted interconnected entities of outages of telemetering and telecommunication equipment, control equipment, monitoring and assessment capabilities, and associated communication channels between it and the affected entities. COM standards are not in scope for this project.

Standard	Source	Language	Resolution
		Requirement should be covered under COM-001	
TOP-001-2	IERP	Requirement R8 does not cover all information needed for reliability. It should cover 1) SOLs within a TOP's/RC's footprint, 2) SOLs that are within one TOP's/RC's footprint that could affect another entity and 3) an SOL that spans into 2 TOP's/RC's footprints The requirement should also obligate the TOP to also inform impacted TOPs (The entity that could be impacted must tell the TOP that could impact them that it needs the info)	The SDT has addressed issue 1 in proposed TOP-001-3, Requirement R15. SOLs that cross boundaries are taken care of at the Reliability Coordinator level. **Proposed TOP-001-3, Requirement R15:** **R15**. Each Transmission Operator shall inform its Reliability Coordinator of actions taken to return the System to within limits when a SOL has been exceeded.
TOP-002-3	Order 693	1597. Consider ISO-NE recommendation that the reference to "transmission service provider" in TOP-002-2 R12 be replaced by TOP and/or TO. Requirement R12 states: The Transmission Service Provider shall include known SOLs and IROLs within its area and neighboring areas in the determination of transfer capabilities, in accordance with filed tariffs, and or regional Total Transfer Capability and Available Transfer Capability calculation processes.	This requirement is now addressed by approved MOD-028-2, Requirement R6.1; approved MOD-029-1a, Requirement R3; and approved MOD-030-2, Requirement R2.4. Because IROLs by definition are a subset of SOLs, IROLs are included. **Approved MOD-028-2, Requirement R6.1:** **R6.1** Determine the incremental Transfer Capability for each ATC Path by increasing generation and/or decreasing load within the source Balancing Authority area and decreasing generation and/or increasing load within the sink Balancing Authority area until either: A System Operating Limit is reached on the Transmission Service Provider's system, or

Standard	Source	Language	Resolution
			A SOL is reached on any other adjacent system in the Transmission model that is not on the study path and the distribution factor is 5% or greater. **Approved MOD-029-1a, Requirement R3**: **R3.** Each Transmission Operator shall establish the TTC at the lesser of the value calculated in R2 or any System Operating Limit (SOL) for that ATC Path. Approved MOD-030-2, Requirement R2.4: Establish the TFC of each of the defined Flowgates as equal to: For thermal limits, the System Operating Limit (SOL) of the Flowgate. For voltage or stability limits, the flow that will respect the SOL of the Flowgate.
TOP-002-3	Order 693	1598. Requires next-day analysis of minimum voltages at nuclear power plants auxiliary power buses.	The data specification standard require that a Reliability Coordinator and Transmission Operator acquire all of the data necessary for them to fulfill their reliability functions including non-BES data as necessary. Next-day analysis is performed using Operational Planning Analysis. Approved NUC-001-2.1 also applies here. **Proposed IRO-010-2, Requirement R1 and Part 1.1:** **R1.** The Reliability Coordinator shall maintain a documented specification for the data necessary for it to perform its Operational Planning Analyses, Real-

Standard	Source	Language	Resolution
			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. **Proposed TOP-003-3, Requirement R1 and Part 1.1**: **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. **Proposed Definition: 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

Standard	Source	Language	Resolution
			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.)
TOP-002-3	Order 693	1600. Address critical energy infrastructure confidentiality as part of the routine standard development process	The data specification standards now contain provisions for addressing security of data. **Proposed IRO-010-2, Requirement R3, Part 3.3**: **R3. Part 3.3** A mutually agreeable security protocol. **Proposed TOP-003-3, Requirement R5, Part 5.3:** **R5. Part 5.3** A mutually agreeable security protocol.
TOP-002-3	Order 693	1601. …direct the ERO to modify Reliability Standard TOP-002-2 to require the next-day analysis for all IROLs to identify and communicate control actions to system operators that can be implemented within 30 minutes following a contingency to return the system to a reliable operating state and prevent cascading outages	SOLs are the responsibility of the Transmission Operator and IROLs are the responsibility of the Reliability Coordinator. This issue is addressed in proposed changes to the IRO standards. Approved IRO-009-1, Requirement R1 also applies. **Proposed IRO-008-2, Requirement R1**: **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.

Standard	Source	Language	Resolution
			Proposed IRO-008-2, Requirement R2: **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. **Proposed IRO-008-2, Requirement R3**: **R3**. Each Reliability Coordinator shall notify impacted entities identified in its Operating Plan(s) cited in Requirement R2 as to their role in that plan(s). **Approved IRO-009-1, Requirement R1:** **R1.** For each IROL (in its Reliability Coordinator Area) that the Reliability Coordinator identifies one or more days prior to the current day, the Reliability Coordinator shall have one or more Operating Processes, Procedures, or Plans that identify actions it shall take or actions it shall direct others to take (up to and including load shedding) that can be implemented in time to prevent exceeding those IROLs.
TOP-002-3	Order 693	1606. Commenters did not take issue with the proposed interpretation of the term deliverability as the ability to deliver the output from generation resources to firm	The SDT agrees and has addressed the issue in proposed TOP-002-3, Requirement R4, part 4.4:

Standard	Source	Language	Resolution
		load without any reliability criteria violations for plausible generation dispatches. The Commission adopts this proposed interpretation. In order to ensure the necessary clarity, the term as used in Requirement R7 of TOP-002-2 should be understood in this manner.	Each Balancing Authority shall have an Operating Plan(s) for the next-day that addresses: 4.4 Capacity and energy reserve requirements, including deliverability capability.
TOP-002-3	Order 693	1608. Require simulation contingencies to match what will actually happen in the field	The SDT has revised the definitions of Operational Planning Analysis and Real-time Assessment accordingly. The definitions require Contingencies to match field conditions as they require evaluations against projected system conditions for Operational Planning Analysis and system conditions for Real-time Assessment. **Proposed Definition: 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 may 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.) **Proposed Definition: Real-time Assessment** - An evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions. The

Standard	Source	Language	Resolution
			assessment may 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.)
TOP-002-3	IERP	Requirement R1. TOP-008-1 R4 needs to be incorporated into TOP-002-3 requirement R1. Also - the definition of "Operational Planning Analysis" provides too much latitude in time. Recommend removing the parenthesis in the definition; the entity will make the determination and document (documentation is evidence) the applicability of what it uses for their next day study	The SDT revised the definition of Operating Planning Analysis and Requirement R1. **Proposed: 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.) **Proposed TOP-002-3, Requirement R1**: **R1.** Each Transmission Operator shall have an Operational Planning Analysis that will allow it to assess whether its planned operations for the next

Standard	Source	Language	Resolution
			day within its Transmission Operator Area will exceed any of its System Operating Limits (SOLs).
TOP-003-0	FERC Order 693	1620. …direct the ERO to develop a modification to TOP-003-0 that requires the communication of scheduled outages to all affected entities well in advance to ensure reliability and accuracy of ATC calculations.	The SDT has developed proposed IRO-017-1 Outage Coordination to address these type of issues, specifically proposed IRO-017-1, Requirement R1. This new standard takes into account the recommendations from the Independent Expert Review Panel and SW Outage Report and brings all of the various outage coordination issues into one cohesive standard. **Proposed IRO-017-1, Requirement R1:** **R1**. Each Reliability Coordinator shall develop, implement, and maintain an outage coordination process for generation and Transmission outages within its Reliability Coordinator Area.
TOP-003-0	FERC Order 693	1621 - Incorporate an appropriate lead time for planned outages using suggestions from the various commenters. We direct the ERO to modify the Reliability Standard to incorporate an appropriate lead time for planned outages.	The SDT posed a question on this issue as a fact finding exercise in the second posting of Project 2007-03 in order to assist them in making a decision on how to respond to the FERC directive as requested in Order 693 – "The ERO should utilize the information filed by commenters in the Reliability Standards development process." The majority of respondents indicated that they do not feel that there is a reliability based need for such a North American requirement. Several respondents pointed out that such a requirement (if needed at all for reliability) would be better suited to a regional

Standard	Source	Language	Resolution
			standard and several others stated that such requirements already exist in their particular regions. There are several regions that have existing rules for lead times but they are all different and are based on the requirements of their regional markets. Any attempt to impose a North American standard runs the risk of interfering with those FERC approved markets. While NERC Reliability Standards are intended to promote reliability, they must at the same time accommodate competitive electricity markets. In response to concerns raised by the IERP and the SW Outage Report, the SDT has developed proposed IRO-017-1 Outage Coordination. This standard requires the development of a coordinated outage process between the Reliability Coordinator, Transmission Operator, Balancing Authority, Planning Coordinator, and Transmission Planner. If so desired, a Reliability Coordinator could include lead times in its process. (See proposed IRO-017-1, Requirement R1, Part 1.2.) In addition, proposed IRO-010-2 and TOP-003-2 dealing with data specifications could also cover this issue. The data specification must include any and all data required by the Reliability Coordinator, Transmission Operator and Balancing Authority. Planned outage data and timings could be included in such a data specification.

Standard	Source	Language	Resolution
			Therefore, the SDT has not included a standard lead time in the revised requirements. **Proposed IRO-017-1, Requirement R1, Part 1.2:** **1.2** Specify outage submission timing requirements.
TOP-003-0	Order 693	1622. Consider TVAs suggestion for including breaker outages within the meaning of facilities that are subject to advance notice for planned outages.	The SDT has developed proposed IRO-017-1 Outage Coordination to address these types of issues. **Proposed IRO-017-1, Requirement R1:** **R1.** Each Reliability Coordinator shall develop, implement, and maintain an outage coordination process for generation and Transmission outages within its Reliability Coordinator Area.
TOP-003-0	Order 693	1624. Direct the ERO to modify the Reliability Standard to require that any facility below the thresholds that, in the opinion of the transmission operator, balancing authority, or reliability coordinator will have a direct impact on the reliability of the Bulk-Power System be subject to Requirement R1 for planned outage coordination.	The data specification standard require that a Reliability Coordinator and Transmission Operator acquire all of the data necessary for them to fulfill their reliability functions including sub-100 kV data as necessary. **Proposed IRO-010-2, Requirement R1 and Part 1.1**: **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

Standard	Source	Language	Resolution
			monitoring, and Real-time Assessments including non-BES data and external network data, as deemed necessary by the Reliability Coordinator. **Proposed TOP-003-3, Requirement R1 and Part 1.1:** **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.
TOP-003-2	IERP	Requirements R1 and R2 do not address level of accuracy required; see if this is provided elsewhere (i.e. project 2009-02) Consolidate R1 and R2 at minimum; at max consolidate with RC (IRO-010-1a R1)	Level of accuracy is one of the issues identified in the Real-Time Tools Best Practices Task Force Report. NERC is currently instituting a review of all of the recommendations in various reports, including the Real-time Tools Best Practices Task Force report, to see what actions should be taken, if any are still required, to address recommendations in the reports. The SDT does not want to consolidate the two responsibilities. The industry has clearly indicated a desire for separate standards for the Reliability

Standard	Source	Language	Resolution
			Coordinator and Transmission Operator where possible.
TOP-003-2	IERP	Consolidate R3 and R4 at minimum; at max consolidate with RC (IRO-010-1a R2)	The SDT does not want to consolidate the two requirements or the two standards. The SDT feels Requirements R3 and R4 are for different tasks. The industry has clearly indicated a desire for separate standards for the Reliability Coordinator and Transmission Operator where possible.
TOP-003-2	IERP	Requirement R5 should be consolidated with IRO-010-1a R3	The industry has clearly indicated a desire for separate standards for the Reliability Coordinator and Transmission Operator where possible.
TOP-004-1	FERC Order 693	1636 - Modify requirement R4 to state that the system should be restored to respect proven limits as soon as possible taking no more than 30 minutes.	The SDT believes that this issue has been addressed through the more stringent definitions proposed for Operational Planning Analysis, Real-time Assessment, and the requirement for the Transmission Operator to perform an Operational Planning Analysis as well as a Real-time Assessment every 30 minutes and to create an Operating Plan for mitigation of SOL exceedances. The SDT has developed a white paper on the topic of SOL exceedance to explain the technical rationale behind this resolution. **Proposed Definition: 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 may reflect applicable inputs including, but not limited to, load forecasts; generation output levels; Interchange; known

Standard	Source	Language	Resolution
			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.) **Proposed Definition: 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 may 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.) **Proposed TOP-002-4, Requirement R1**: **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). **Proposed TOP-002-4, Requirement R2**: **R2.** Each Transmission Operator shall have an Operating Plan(s) for next-day operations to address potential System Operating Limit (SOL) exceedances

Standard	Source	Language	Resolution
			identified as a result of its Operational Planning Analysis as required in Requirement R1. **Proposed TOP-001-3, Requirement R13**: **R13.** Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes. **Proposed TOP-001-3, Requirement R14**: **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.
TOP-004-1	Order 693	1637. …direct the ERO to conduct a survey on the operating practices and actual experiences surrounding drifting in and out of IROL violations.	Completed and filed in Oct 2008.
TOP-004-1	FERC Order 693	1638 - Defines high risk conditions under which the system must be operated to respect multiple outages in requirement R3. We direct the ERO to develop a modification to the Reliability Standard that explicitly incorporates this interpretation with the details identified in the Reliability Standards development process (… the Commission proposed to interpret "multiple outages" in the context of Requirement R3 to include multiple element outages resulting from high risk conditions such as hurricanes, wild fires, ice storms or periods of high solar magnetic disturbances during which the probability of multiple outages approaches that of a single element outage. This is not an	The SDT feels that approved EOP-001-2.1b dealing with emergency operations planning covers the intent of being prepared to react to the cited situations. The method chosen to respond to a given catastrophic challenge to a localized portion of the system cannot be predetermined by science; rather, it is an art. Reliability entities develop their response mechanisms based on experience in their local areas to achieve the maximum societal benefit during these periods. In addition, approved FAC-011-2 and FAC-014-2 deal with specific requirements for dealing with multiple contingencies.

Standard	Source	Language	Resolution
		exhaustive list but is meant to contain illustrative examples, and the Reliability Standards development process should develop a procedure to identify applicable high risk conditions. Under … high-risk conditions, the Commission understands that systems are normally operated in a more secure manner so that the Bulk-Power System can withstand multiple outages. These multiple outages exceed the normal N-1 criterion because the probability of multiple outages during high risk conditions approaches that of a single outage during normal conditions.)	
TOP-004-1	Order 693	1639. Consider Santa Clara's comment in the SDT process. Santa Clara states that Requirement R2 of the Reliability Standard should be revised to include frequency monitoring in addition to the monitoring of voltage, real and reactive power flows	The data specification standards require that entities obtain all of the data that they need to perform their reliability functions. This would include frequency, voltages, real and reactive power flows, and any other data that the entity needs. Proposed TOP-001-3, Requirements R10 and R11 also address this item. **Proposed IRO-010-2, Requirement R1**: **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. **Proposed TOP-003-3, Requirement R1**: **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. **Proposed TOP-001-3, Requirement R10**:

Standard	Source	Language	Resolution
			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. **Proposed 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 Load-interchange balance within its Balancing Authority Area and support Interconnection frequency.
TOP-004-1	Version 0 Team	Vagueness in application of IROL limits	The SDT has clarified the issue. **Proposed TOP-001-3, Requirement R12:** **R12.** Each Transmission Operator shall not operate outside any identified Interconnection Reliability Operating Limit (IROL) for a continuous duration exceeding its associated IROL T_v.
TOP-005	Order 693	1648. ...direct the ERO to develop a modification to TOP-005-1 through the Reliability Standards development process regarding the operational status	The SDT has added specific parts to the data specification standards as well as revising the

Standard	Source	Language	Resolution
		of special protection systems and power system stabilizers in Attachment 1.	definitions of Operational Planning Analysis and Real-time Assessment to address this issue. **Proposed: 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 may 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.) **Proposed: 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 may 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.) **Proposed IRO-010-2, Requirement R1, Part 1.2**:

Standard	Source	Language	Resolution
			1.2 Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **Proposed TOP-003-3, Requirement R1, Part 1.2**: 1.2 Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability.
TOP-005	Order 693	1650. Consider FirstEnergy's modifications to Attachment 1 and ISO-NEs recommended revision to requirement R4 in the standards development process. FirstEnergy states that TOP-005-1 should also apply to transmission providers because some of the information listed in Attachment 1 to the Reliability Standard is in their possession. Attachment 1 should be modified so that it allows each entity to know what data it is expected to provide. ISO-NE recommends that the reference to "purchasing-selling entity" should be replaced with LSE.	Attachment 1 has been deleted and replaced by the new data specification requirement in proposed TOP-003-3. Requirement R4 has been superseded by proposed TOP-003-3 which does include the indicated entities and has deleted PSE. **Proposed TOP-003-3, Requirement R5**: **R5.**Each Transmission Operator, Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall satisfy the obligations of the documented specifications using:
TOP-005	Order 693	1651. … deletes references to confidentiality agreements, but addresses the issue separately to ensure that necessary protections are in place related to confidential information.	The SDT believes that confidentiality is a market issue and not a reliability issue and as such it does not belong in the Reliability Standards. However, security of information is a reliability concern and the SDT has addressed that issue through the addition of requirements for establishing security protocols in data exchanges.

Standard	Source	Language	Resolution
			Proposed TOP-003-3, Requirement R5, Part 5.3: 5.3 A mutually agreeable security protocol. **Proposed IRO-010-2, Requirement R3, Part 3.3**: 3.3 A mutually agreeable security protocol.
TOP-005	Order 693	1660. Add requirement related to the provision of minimum capabilities that are necessary to enable operators to deal with real-time situations and to ensure reliable operation of the bulk power system	This directive is beyond the scope of this project and will be resolved in a future project.
TOP-006	Order 693	1665. Clarify the meaning of appropriate technical information concerning protective relays	That term is no longer used in the standards. To address concerns about the status of protection systems, the SDT has incorporated explicit references in the definitions of Operational Planning Analysis and Real-time Assessment and the data specification standards. **Proposed Definition: 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 may 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.)

Standard	Source	Language	Resolution
			Proposed Definition: 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 may 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.) **Proposed IRO-010-2, Requirement R1, Part 1.2**: 1.2 Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability. **Proposed TOP-003-3, Requirement R1, Part 1.2**: 1.2 Provisions for notification of current Protection System and Special Protection System status or degradation that impacts System reliability.
TOP-006	Order 693	1664/1681. The ERO should consider APPA's comment regarding the missing Measures in the ERO's Reliability Standards development process.	All requirements now have measures.
TOP-006	Order 693	1673. Direct the ERO to consider NRC's comments in the Reliability Standards development process when addressing TOP-007-0 as part of its Work Plan.	Analysis is required in proposed TOP-002-3, Requirement R1 and in proposed TOP-001-3, Requirement R13. A specified minimum voltage limit is by definition an SOL which must be studied in proposed TOP-002-3, Requirement R1 and proposed

Standard	Source	Language	Resolution
		NRC states that some nuclear power plant voltage requirements would result in SOL, i.e., the nuclear power plant voltage limits would be an SOL as a result of the minimum and maximum voltages required at the nuclear power plant switchyard, which typically has a tighter operating band (a higher minimum and a lower maximum) than other nodes in the system. It therefore recommends adding a new requirement that states as follows: "Following discovery of a potential contingency that could result in an SOL being exceeded at a nuclear power plant (e.g., at post-trip voltage), the transmission owner shall notify the nuclear power plant operator as soon as possible but not longer than 30 minutes if the contingency has not been corrected." NRC also suggests modifying the Measures and Compliance sections and Table 1 to account for the new requirement, and provides specific language to be included in those places.	TOP-001-3, Requirement R13 as shown in the revised definition of Operational Planning Analysis and Real-time Assessment. Additionally, approved NUC-001-2.1, Requirements R3 & R4.1 require the transmission entity to incorporate NPIRs in their planning and operating analyses. Approved FAC-011-2 and approved FAC-014-2, Requirement R2 require the Transmission Operator to incorporate SOLs into their analyses. All data required for Operational Planning Analyses is stipulated in proposed TOP-003-3. Approved NUC-001-2, Requirements R3 & R8 cover the information flowing back to the nuclear plant operator. **Proposed Definition: 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 may 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.) **Proposed Definition: Real-time Assessment** - An evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential

Standard	Source	Language	Resolution
			(post-Contingency) operating conditions. The assessment may 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.) **Proposed TOP-002-3, Requirement R1**: **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). **Proposed TOP-001-3, Requirement R13**: **R13.** Each Transmission Operator shall ensure that a Real-time Assessment is performed at least once every 30 minutes. **Approved NUC-001-2.1, Requirement R3**: **R3**. Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall incorporate the NPIRs into their planning analyses of the electric system and shall communicate the results of these analyses to the Nuclear Plant Generator Operator. **Approved NUC-001-2.1, Requirement R4.1**:

Standard	Source	Language	Resolution
			4.1 Incorporate the NPIRs into their operating analyses of the electric system. **Approved NUC-001-2.1, Requirement R8:** **R8.** Per the Agreements developed in accordance with this standard, the applicable Transmission Entities shall inform the Nuclear Plant Generator Operator of actual or proposed changes to electric system design, configuration, operations, limits, Protection Systems, or capabilities that may impact the ability of the electric system to meet the NPIRs.
VAR-001-1	Order 693 Transferred from Project 2013-04 Voltage and Reactive Control	1855. Since a reliability coordinator is the highest level of authority overseeing the reliability of the Bulk-Power System, the Commission believes that it is important to include the reliability coordinator as an applicable entity to assure that adequate voltage and reactive resources are being maintained. As MISO points out, other Reliability Standards address responsibilities of reliability coordinators, but we agree with EEI that it is important to include reliability coordinators in VAR-001-1 as well. Reliability coordinators have responsibilities in the IRO and TOP Reliability Standards, but not the specific responsibilities for voltage levels and reactive resources addressed by VAR-001-1, which have a great impact on system reliability. For example, voltage levels and reactive resources are important factors to ensure that IROLs are valid and operating voltages are within limits, and that reliability coordinators should have responsibilities in	The SDT has clarified the issue of having the Reliability Coordinator provide oversight. The proposed requirement uses the term 'Facilities' which is defined as: "A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generator, a shunt compensator, transformer, etc.)." Therefore, the requirement covers voltage and reactive resources. **Proposed IRO-002-4, Requirement R3**: **R3**. Each Reliability Coordinator shall monitor Facilities, the status of Special Protection Systems, and non-BES facilities identified as necessary by the Reliability Coordinator, within its Reliability Coordinator Area and neighboring Reliability Coordinator Areas to identify any System Operating Limit exceedances and to determine any

Standard	Source	Language	Resolution
		VAR-001-1 to monitor that sufficient reactive resources are available for reliable system operations. Accordingly, the ERO should modify VAR-001-1 to include reliability coordinators as applicable entities and include a new requirement(s) that identifies the reliability coordinator's monitoring responsibilities.	Interconnection Reliability Operating Limit exceedances within its Reliability Coordinator Area.
INT-006-1	Order 693 Transferred from Project 2008-12 Coordinate Interchange Standards	866. The Commission directs the ERO to develop a modification to INT-006-1 through the Reliability Standards development process that makes it applicable to reliability coordinators and transmission operators. The Commission directs the ERO to develop a modification to INT-006-1 through the Reliability Standards development process that requires reliability coordinators and transmission operators to review energy interchange transactions from the wide-area and local area reliability viewpoints respectively and, where their review indicates a potential detrimental reliability impact, communicate to the sink balancing authorities necessary transaction modifications before implementation.	An equally efficient and effective method of addressing the directive was approved by the Board and filed with FERC by Project 2008-12 SDT by including the term 'Interchange' in the definition of Operational Planning Analysis. This change has been retained by Project 2014-03. Proposed IRO-008-2, Requirement R1 specifies that the Reliability Coordinator must perform an Operational Planning Analysis. By explicitly including "Interchange" in the definition of Operational Planning Analysis, the Reliability Coordinator must consider Interchange when performing the study. Then, in proposed IRO-008-2, Requirement R2, the Reliability Coordinator must develop a plan for addressing the problem. Similar requirements exist for the Transmission Operator in proposed TOP-002-3. **Proposed: 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 may reflect applicable inputs including,

Standard	Source	Language	Resolution
			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.) **Proposed IRO-008-2, Requirement R1:** **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. **Proposed IRO-008-2, Requirement R2**: **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. **Proposed IRO-008-2, Requirement R3:**

Standard	Source	Language	Resolution
			R3. Each Reliability Coordinator shall notify impacted entities identified in its Operating Plan(s) cited in Requirement R2 as to their role in that plan(s). **Proposed TOP-002-4, Requirement R1:** **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). **Proposed TOP-002-4, Requirement R2:** **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. **Proposed TOP-002-4, Requirement R3:** **R3**. Each Transmission Operator shall notify impacted entities identified in the Operating Plan(s) cited in Requirement R2 as to their role in those plan(s).