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# Project 2009-02 Real-time Reliability Monitoring and Analysis Capabilities

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Industry Webinar

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**RELIABILITY | ACCOUNTABILITY**



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- Participants are reminded that this meeting is public. Notice of the meeting was posted on the NERC website and widely distributed. Participants should keep in mind that the audience may include members of the press and representatives of various governmental authorities, in addition to the expected participation by industry stakeholders.

- Project background
- Standards Authorization Request (SAR) development
- Overview of draft standard and implementation plan
- Next steps
- Discussion

- NERC Operating Committee's Real-time Tools Best Practices Task Force (RTBPTF)
- Project 2009-02 aims to address situational awareness issues relevant to Real-time monitoring and analysis of the Bulk Electric System (BES)
- Formal development paused in 2011
- Project 2009-02 resumed April 2015 to address issues not covered under existing or proposed standards (TOP and IRO)
  - Project 2014-03 Revised TOP/IRO Standards pending regulatory approval
  - New definition for Real-time Assessments

- SAR and Whitepaper developed and posted in July 2015
- SAR comment period July 16 – August 17, 2015
- SAR comments reviewed August 2015
- Draft standards developed August – September 2015
  - Standards Committee (SC) authorized posting September 23, 2015
- Standards posted for comment and initial ballots September 24 – November 9, 2015

Position	Participant	Entity
Chair	Saad Malik	Peak Reliability
Vice Chair	Andrew Pankratz	Florida Power & Light
Member	Charles Abell	Ameren
Member	Scott Aclin	Southwest Power Pool
Member	Phil Hart	AECI
Member	T.J. (Tim) Kucey	PSEG Fossil, LLC
Member	Alan Martin	Southern Company Transmission
Member	Bert Peters	Arizona Public Service
Member	Sarma Nuthalapati	Electric Reliability Council of Texas
Member	Jim Useldinger	Kansas City Power and Light
Staff	Mark Olson	NERC
Staff	Sean Bodkin	NERC



# **SAR Development**



- SAR DT convened April – June to review project inputs
  - 2008 RTBPTF Report [Real-time Tools Survey Analysis and Recommendations](#)
  - 2011 Project 2009-02 [Concept White Paper & SAR](#) (industry comments)
  - August 2003 Northeast Blackout [Report](#)
  - September 2011 Southwest Blackout [Report](#)
  - FERC Directives
  - Project 2014-03 Revised TOP and IRO Standards (pending regulatory approval)
  - Independent Experts Review Project (IERP) Recommendations

- Technical conference held in June to obtain stakeholder input on project scope
- SAR and justification white paper posted for comment in July
- SAR commenters generally support project scope
- SAR and white paper posted on the [project page](#)

- In approving the original TOP and IRO standards, FERC directed future improvements to ensure operating entities can perform their Real-time reliability functions:
  - P 905: Further, consistent with the NOPR, the Commission directs the ERO to modify IRO-002-1 to require a minimum set of tools that must be made available to the reliability coordinator. We believe this requirement will ensure that a reliability coordinator has the tools it needs to perform its functions.
  - P 906: [t]he Commission clarifies that the Commission's intent is to have the ERO develop a requirement that identifies capabilities, not actual tools or products. The Commission agrees that the latter approach is not appropriate as a particular product could become obsolete and technology improves over time.

- In approving the original TOP and IRO standards, FERC directed future improvements ... (continued) :
  - P 1660: We adopt our proposal to require the ERO to develop a modification [to TOP standards] related to the provision of a minimum set of analytical tools. In response to LPPC and others, we note that our intent was not to identify specific sets of tools, but rather the minimum capabilities that are necessary to enable operators to deal with real-time situations and to ensure reliable operation of the Bulk-Power System.

- Reliability toolbox
  - Telemetry
  - Alarming
  - Network Topology Processing
  - State Estimation
  - Contingency Analysis

- Current and proposed (Project 2014-03) TOP and IRO standards contain many Real-time situational awareness provisions
  - Explicit definitions for Real-time Assessment and Operational Planning Analysis
  - Requirements to perform monitoring and Real-time Assessments contained in approved IRO-002-2, IRO-003-2, and proposed IRO-002-4, IRO-008-2, and TOP-001-3
  - Data specification requirements in IRO-010-1a and proposed IRO-010-2 and TOP-003-3

- Definition and TOP/IRO requirements address ‘Analysis’
  - Developed in Project 2014-03 and pending regulatory approval

**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 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.)

- Essential capabilities
  - Monitoring
  - Analysis
- Effective Real-time situational awareness is supported by *monitoring* and *analysis* that:
  - Is performed with sufficient frequency
  - Provides awareness of information quality
  - Provides indication when processes are not operating normally
- Take corrective actions when:
  - Information quality is bad
  - Processes are not operating normally



- Most RTBPTF recommendations have been addressed
  - Real-time Assessment definition
  - Requirements to perform monitoring and Real-time Assessments
  - Data specification requirements
- Project 2009-02 scope is focused on remaining objectives

Project 2009-02 Reliability Objectives		
	Monitoring Capabilities	Analysis Capabilities
Quality	Provide operator with indication of data quality and procedures to address issues	Provide operator with indication of analysis quality used in Real-time Assessments and procedures to address issues
Availability	Provide operator with notification when alarming system is not operating	N/A



# Overview of Proposed Standards

- Two proposed Reliability Standards have been drafted to meet the SAR objectives
  - IRO-018-1 applicable to Reliability Coordinators (RCs)
  - TOP-010-1 applicable to Transmission Operators (TOPs) and Balancing Authorities (BAs)
- Proposed requirements address:
  - Quality of data necessary to perform Real-time monitoring and analysis
  - Quality of analysis used in Real-time Assessments
  - System Operator notification of alarm processor failure

## Proposed requirements for RCs:

- R1: Implement an Operating Procedure or Operating Process to address the quality of Real-time data necessary to perform Real-time monitoring and Real-time Assessments. Include:
  - Criteria for evaluating data quality:
    - out of range
    - stale analogs
    - manually entered
    - other
  - Actions to coordinate resolution
- R2: Provide System Operators with indications of data quality
- Applies to data specified in approved IRO-010-1a – RC Data Specification and Collection

Proposed requirements for RCs (cont'd):

- R3: Implement an Operating Procedure or Operating Process to maintain the quality of any analysis used in its Real-time Assessments. Include:
  - Criteria for evaluating the quality of any analysis used in Real-time Assessments
  - Actions to resolve quality deficiencies
- R4: Provide System Operators with indications of the quality of any analysis used in its Real-time Assessments

## Proposed requirements for RCs (cont'd):

- R5: Utilize an independent alarm process monitor that provides notification(s) to System Operators when a failure of its Real-time monitoring alarm processor has occurred
- Examples include 'heartbeat' or 'watchdog' monitoring systems

- TOP-010-1 is applicable to TOPs and BAs
- Applies to Real-time data specified in proposed TOP-003-3 – Operational Reliability Data

### Requirements for TOPs

- Operating Procedure or process for data quality (R1)
- Operator indication of data quality (R3)
- Operating Procedure or process for analysis quality (R5)
- Operator indication of analysis quality (R6)
- Independent alarm process monitor (R7)

## Requirements for BAs

- Operating Procedure or process for data quality (R2)
- Operator indication of data quality (R4)
- Independent alarm process monitor (R7)



Requirements		12 months	18 months
IRO-018-1	Data Quality (R1, R2)	X	
	Analysis Quality (R3, R4)		X
	Alarm Process Monitor (R5)	X	
TOP-010-1	Data Quality (R1, R2, R3, R4)	X	
	Analysis Quality (R5, R6)		X
	Alarm Process Monitor (R7)	X	

- Draft standards and implementation plan are posted for comment and initial ballots through November 9, 2015
  - Ballot pools forming through October 23, 2015 (8 pm eastern)
  - Initial ballots October 30 – November 9, 2015
- SDT will meet in November to consider comments and revise
- Details on [project status](#) can be found at the NERC website



# Discussion