Project 2009-02 Real-time Monitoring and Analysis Capabilities: Meeting Notes

1. Administration

a. Introductions and Quorum

The Chair convened the meeting at 1400 CST on Monday, December 6, 2010 in the Entergy offices in New Orleans, LA. Meeting participants were:

Charles Abell, Vice Chair	Tom Bradish	Sam Brattini, Chair
Jay Dondetti	Vinit Gupta	Mike Hougham
Jack Kerr	Mike Richardson	Bob Savage
Bob Staton	Scott Vidler	Jerry Whooley
Ed Dobrowolski, NERC		

Tom Bradish announced that he was retiring at the end of the year and will thus need to resign from the SDT. The Chair thanked Tom for his valued participation in the efforts to date.

b. NERC Anti-trust Guidelines and Announcements – Ed Dobrowolski

No questions were raised on the NERC Antitrust Compliance Guidelines. Warnings were issued about the dangers inherent in conference call participation.

c. Review Agenda and Meeting Objectives – Sam Brattini

The objective of the meeting was to progress with the drafting of the white paper with the aim of meeting the published schedule.

2. Discuss White Paper Drafts

The Chair expressed his thanks to all of those who worked on the drafts.

Generic comments about the eventual Implementation Plan will be included in the Introduction.

a. Alerts – Scott Vidler & Mike Richardson

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Scott and Mike led the SDT through their draft. The following outline for the paper was developed based on that information:

- Applicability – RC, TOP, and BA
- What - Alert System Operators in real-time to events and conditions affecting the state of the Bulk Electric System (BES)
  - What – limit exceedances (for any defined limits)
  - What – status changes
  - What – RTU availability
  - What – data link availability
  - Audible and visual
- 'Why' – pull from Mike's report
- Proposed requirements
  - Performance:
    - Volume of alarms – recognized as issue but generally handled in initial specifications, never seen as a problem in real world situations, difficult if not impossible to measure in production systems
    - Throughput - recognized as issue but generally handled in initial specifications, never seen as a problem in real world situations, difficult if not impossible to measure in production systems
  - Availability
    - No numeric value
    - Communication issue through hierarchical functional model approach, i.e., RC 'backs up' TOP/BA and vice versa and entities inform each other of failure on a 10 minute basis (page 117, #4)
    - Violation if down more than 2 hours
  - Independent failure notification
    - Define independent
    - Notification of failure to System Operator within 60 seconds of when failure occurred
  - Maintenance - Each functional entity shall provide System Operators with approval rights for planned maintenance of its alarming, monitoring, data exchange, and analysis capabilities.

b. Data Exchange – Jack Kerr & Jerry Whooley

Jack & Jerry led the SDT through their draft. The following outline for the paper was developed based on that information:

- Applicability – RC, TOP, BA, and GOP
- What - Electronic exchange of data between 2 systems whether internal or external (computer to computer)
  - Assumptions – ICCP or equivalent (not RTU)

- o Description of ICCP: The Inter-Control Center Communications Protocol (ICCP or IEC 60870-6/TASE.2) is an international standard used by utility organizations to provide data exchange over wide area networks (WANs) between utility control centers, utilities, power pools, regional control centers, and Non-Utility Generators.
- o Data exchange agreement must include following:
  - Interoperability of ICCP and equivalent systems
  - Data access restrictions
  - Data naming conventions
  - Data management and coordination including data quality
  - Joint testing and data checkout
  - Responsibility for failures
- o Data sets covered in proposed IRO-010 and TOP-003
- Why
  - o Collecting and exchanging real-time data on power system status is the first and most elementary step in the complex process of developing the information that electric system operators need to maintain situational awareness. Real-time reliability tools such as the state estimator and contingency analysis can only provide results that accurately represent current and potential reliability problems if these tools have real-time power-flow and voltage values and status data for other elements included in their models. The accuracy of the information that real-time reliability tools provide depends on the accuracy of the data supplied to the tools. The quality of the results that real-time reliability tools produce is also influenced by the breadth and depth of the portion of the bulk electric system for which real-time data are collected, relative to the breadth and depth of the relevant reliability entity's area of responsibility. Thus, how we define the elements that constitute the bulk electric system is very important for the information that operators reply to for situational awareness.
- Proposed requirements:
  - Performance
    - o Meet data exchange agreements and adhere to data specifications, nothing else needed
  - Availability
    - o Establish procedure for what to do if data not available
    - o On a per provider basis, each time a data set should have been received, the recipient would calculate the ratio of the number of data points received with "good" quality codes to the total number of data points expected. This ratio should exceed 99 percent for 99 percent of the sampled periods (e. g., 10 seconds each) over a calendar month.

- In addition, this ratio should not be less than 99 percent for 30 consecutive minutes.
  - 'good' quality code is TBD
- Failure notification – Notification of link failure to System Operator within 60 seconds of when link failure occurred. Failure is inability to receive a complete data set regardless of reason.
- Maintenance - Each functional entity shall provide System Operators with approval rights for planned maintenance of its alarming, monitoring, data exchange, and analysis capabilities. Coordination with other end required.

AI – Sam will look up the ICCP data quality codes for inclusion in the next draft of the White Paper.

c. Monitoring (Telemetry) – Bob Savage & Vinit Gupta

Bob & Vinit led the SDT through their draft. The following outline for the paper was developed based on that information:

- Applicability: RC, TOP, and BA
- What
  - "Monitor" does not imply viewing large amounts of raw telemetered data but rather viewing data in a manner and format that allows operators to judge the state of the bulk electric system in real-time and take corrective actions when necessary.
  - List of data required to judge state of system (analogous to TOP-003 for data exchange)
  - Types of data
    - Real-time analog and status data
      - Scan
      - Calculated
    - Pulse accumulators
- Why – allows operators to rapidly judge the state of the bulk electric system and take corrective action when necessary
- Proposed requirements
  - Performance
    - Status data - Scan rate of 2 seconds which is the scan rate generally used for Disturbance Data Collection for analysis of BES significant events
    - Analog data – ACE data handled in BAL standard (6 seconds), all other at 10 seconds (from RTBPTF Report)
    - Pulse accumulators once per hour
    - All active displays should update by the end of the next scan cycle
  - Availability
    - Establish procedure for what to do if data not available

- On a DCU basis (define DCU), the entity shall calculate availability by dividing the number of 'good' scans received by the number of scans scheduled in a calendar month. This ratio should exceed 99 percent for a calendar month.
  - A 'good' scan is a complete packet of requested information returned to the central system.
- Failure notification - Notification to System Operator after nine consecutive failures, within 60 seconds of when 9th consecutive DCU failure occurred. Failure is inability to complete a scan regardless of reason.
- Maintenance - Each functional entity shall provide System Operators with approval rights for planned maintenance of its alarming, monitoring, data exchange, and analysis capabilities.

d. Analysis – Sam Brattini, Jack Kerr, & Mike Houglum

Sam, Jack, and Mike led the SDT through their draft. The following outline for the paper was developed based on that information:

- Applicability: RC and TOP
- What - The intent is to focus on determining the current condition or state of the BES and evaluate the impact of 'what if' events on the state of the BES.
  - Current - Determine the system's current condition or state. The system condition or state is a function of knowing the system bus voltages, system topology, frequency, and line flows.
  - 'What if' - Analyze the impact on current power system security of specific, simulated outages (lines, generators, or other equipment). The analysis identifies problems such as line overloads or voltage violations that will occur if the system event (contingency) takes place.
- Why - The capability to determine the current state of BES is critical for the operator to determine violations of reliability criteria in their area. By accurately determining the current state of the BES the operator is thus capable of evaluating various 'what if' scenarios. Having the results of the 'What If' events before they happen allows operators to take the appropriate actions to prevent violations, or have plans ready if such contingencies were to occur.
- Proposed requirements:
  - Performance
    - Establish procedure for what to do if program/method not available
    - How often to do analysis
      - Current – Split up requirement for RC & TOP

- o For RC: Self provided on-line, automated program required that runs periodically at 5 minute interval to determine the system's current condition or state
- o For TOP: Self provided on-line, automated program required that runs periodically at 5 minute interval to determine the system's current condition or state BUT may be provided either through their own program or contracted services (3rd party or RC/TOP)
- o Separate requirement for TOP in WECC due to nomograms
- What if – Split up requirement for RC & TOP
  - o For RC: On-line, automated program required that runs periodically at 10 minute interval (from pg. 117 of Blackout Report - #4.b)
  - o For TOP: On-line, automated program required that runs periodically at 10 minute interval (from pg. 117 of Blackout Report - #4.b) BUT may be provided either through their own program or contracted services (3rd party or RC/TOP)
  - o Separate requirement for TOP in WECC due to nomograms
- o Quality of results –
  - Current & What if:
    - o For RC & TOP: compare 'tie' line values and generator injections from on-line, automated program plus selected transmission lines to actual metered values every time the program runs, accumulate delta values over a weekly period, compute TBD, tolerance must be +/- x% or a violation has occurred
    - o Separate for TOP with WECC nomograms
- o Availability - TBD
- o Failure notification - TBD

- o Maintenance - Each functional entity shall provide System Operators with approval rights for planned maintenance of its alarming, monitoring, data exchange, and analysis capabilities.

AI – SDT members will research how to measure performance of the analysis requirements and provide feedback through the list server no later than December 17, 2010.

e. Approach – Chuck Abell

The Approach Section will be replaced with an Introduction.

3. Next Steps – Sam Brattini

Sam and Ed will work on a draft of the White Paper and distribute it to the SDT for review no later than January 7, 2011. The SDT will review the draft White Paper prior to the scheduled conference call. E-mail comments can be sent to the list server prior to the call.

AI – Sam & Ed will distribute a draft of the White Paper for SDT review no later than January 7, 2011.

Darrell Piatt will notify Ed if FERC staff wishes to meet with the SDT prior to the first posting. This notification should be received no later than December 23, 2010.

AI – Darrell will notify Ed no later than December 23, 2010 if FERC staff wishes to meet with the SDT prior to the first posting.

In the preliminary prioritization of standards projects by the Standards Committee, this project is ranked 23 out of 34. The Standards Committee will be finalizing the prioritization and making decisions on whether projects should be delayed or cancelled at their January meeting.

4. Future Meetings

There will be a conference call and web ex on Friday, January21, 2011. Details will be provided at a later date.

5. Action Items & Schedule – Ed Dobrowolski

The following action items were developed during this meeting:

- Sam & Ed will distribute a draft of the White Paper for SDT review no later than January 7, 2011.

- Darrell will notify Ed no later than December 23, 2010 if FERC staff wishes to meet with the SDT prior to the first posting.

- Sam will look up the ICCP data quality codes for inclusion in the next draft of the White Paper.

- SDT members will research how to measure performance of the analysis requirements and provide feedback through the list server no later than December 17, 2010.

With the milestones noted in Section 3, the project remains on schedule for the first posting (White Paper).

6. Adjourn

The Chair thanked Entergy for their hospitality and adjourned the meeting at 1130 CST on Thursday, December 09, 2010.