Meeting Minutes
System Analysis and Modeling Subcommittee
April 29 - May 1, 2014

SERC Reliability Corporation Offices
2815 Coliseum Centre Drive, Suite 500
Charlotte, NC 28217

1. Administrative
The meeting commenced at 1:00 p.m. EDT with the following members present during the meeting:

Salva Andiappan        MRO
Amos Ang               SCE
Andrew Arana           FPL
Kent Bolton            WECC
Mark Byrd              Duke Energy Progress
Roman Carter           North American Transmission Forum (NATF)
Chuck Chakravarthi     Southern Company
José Conto             ERCOT
Terry Crawley          Southern Company
Ken Donohoo            Oncor
Ed Ernst               NATF Program Manager
Bill Harm              PJM
Jeff Iler              AEP
Bobby Jones            Southern Company
Ruth Kloecker          ITC Holdings
Durgesh Manjure        MISO
Tom Mielenik           Mid-American Energy Company (MRO)
Bill Miller            Exelon Corporation
John Mills             SPP
Amir Najafzadeh       SERC Reliability Corporation
Zia Salami             UNCC
Ed Scott               Duke Energy Florida
John Simonelli         ISO New England
Hari Singh             Xcel Energy
Joe Spencer            SERC
Eric Allen             NERC
Scott Barfield         NERC
Neil Burbure           NERC

1 Participated via conference call.
The attendees were apprised of the NERC Antitrust Compliance Guidelines and the public nature of the meeting.

The agenda and meeting minutes were reviewed and approved and the roster was updated.

2. Review Work Plan
The status of the tasks in the work plan was reviewed and updated.

3. SAMS OC Liaison
It was decided that the SAMS coordinator would revise the SAMS roster and send out a request for volunteer(s) to attend OC meetings and keep SAMS apprised of upcoming opportunities to collaborate with the OC.

{Actions: Neil Burbure to update roster and send email request for OC liaison(s).}

4. PC Meeting Update
John Simonelli provided SAMS with a synopsis of the March 2014 PC meeting. He updated SAMS on PC meeting discussions related to:

- The reduction of standards requirements and planning for resource changes attributed to retirements and new resources coming on line.
- Regional updates requested by the PC on impending issues affecting each Region. Some areas of regional concern are possible resource short-falls being faced due to EPA related retirements of resources. Real-time concerns with balancing load forecasts and gas dependency issues affecting dispatch.
- The PAS is working on a process to factor out weather extremes when reporting data in TADS.
- NERC is working on standardization of LTRA terminology and creation of a standardized method for submitting data.
- John thanked Amir Najafzadeh for his update presentation on RTCA (Recommendation 16).
- Information was provided on MOD B efforts and Phil Tatro’s Order No. 754 discussion on single point of failure.
- The effort to create a functional entity with DR responsibilities was not accepted by the PC.
- ERAG has been working on model frequency response tuning efforts.

5. Fault Induced Delayed Voltage Recovery (FIDVR) and Load Modeling Workshop
SAMS discussed and prepared for a Q3 (September) 2014 FIDVR/Load Modeling Workshop in Colorado, at Xcel Energy’s offices. The team set an initial date range between September 30 through October 1,
2014. However, an alternate early September date was also suggested to accommodate significant contributors to the effort. Several topics were discussed including transient voltage dip criteria that is relevant to future compliance with TPL-001-4. TPL-001-4 now includes a requirement for assessing low voltage excursions that may include the study of FIDVR. As the group discussed the topic, it became apparent that the technical conference should focus on composite load modeling and include specialized sections on FIDVR experiences, FIDVR modeling efforts, and attempts at model validation, as they relate to FIDVR. Bob Cummings indicated that the focus of the workshop should remain on FIDVR. {Actions: Neil Burbure to contact Joe Eto (DOE) to determine status of their efforts on FIDVR since the previous workshop in September 2009. SAMS to setup agenda and workshop to be conducted in September 2014.}

6. Node-breaker
SAMS reviewed the node-breaker cost-benefit analysis completed by MWG. SAMS Leadership will have a discussion on how to best present MWG’s findings. {Actions: Neil Burbure to setup call with John Simonelli (SAMS Chair) and Chuck Chakravarthi (SAMS Vice-Chair) to determine how to proceed in time to present findings at upcoming PC meeting in June.}

7. Standardized Component Models
SAMS reviewed the standardized component model documents that have been prepared by MWG. SAMS stated the importance of MWG working with NATF to create one unified document from both groups that addresses standardization of models. A unified document would avoid industry confusion and avoid a lack of standardization that may result if two separate documents are created and controlled by separate organizations. It was discussed that the objective of the NATF Modeling Data Request Guide is to provide clarity to equipment owners by defining terms that are commonly used by powerflow and dynamics case builders. The objective of the MWG Standardized Component Models is to identify the set of powerflow parameters that are expected to be present in interconnection-wide powerflow cases and identify those dynamics models that have been deemed suitable for use in interconnection-wide dynamics cases. {Actions: MWG coordinator to assess the NATF Modeling Data Request Guide and determine the practicality of consolidation with items 1 through 3 of the MWG standardized component model implementation plan. This assessment is needed in sufficient time to request a deadline extension for the applicable implementation plan items during the June 2014 PC meeting. John Simonelli, Chuck Chakravarthi, Eric Allen, and Neil Burbure to contact NATF to determine how to harmonize the two groups’ efforts during the week of May 5, 2014.}

8. Southwest Outage Recommendations 5, 6, & 7 and WECC NERC2
SAMS reviewed the Southwest Outage (SW) Recommendations 5, 6, & 7 and WECC Recommendation NERC2 proposal that was created by SAMS and reviewed by MWG. The document was approved for presentation to the PC (Motion to approve: John Mills, Bill Harm made a second motion, and John Simonelli approved the proposal for presentation to the PC). {Actions: SAMS to create presentation for June 2014 PC meeting. The presentation will also include a summary update on SAMS/MWG efforts.}
9. Southwest Outage Recommendation 16: Consistency in Model Parameters (Discrepancies between RTCA & Planning Models)
SAMS reviewed the RTCA vs. planning models implementation plan for change management processes.  
{Actions: MWG [Amir Najafzadeh] agreed to prepare a quick verbal status update for use at the upcoming June 2014 PC meeting. Neil Burbure to support development of update as needed by Amir Najafzadeh.}

10. Southwest Outage Recommendation 9
SAMS preliminarily reviewed the proposal for Southwest Outage Recommendation 9 during the SAMS meeting.  
{Actions: SAMS and MWG to provide comments by Monday, May 5, 2014. If no substantial comments or changes are made, SAMS will seek approval to present this item at the June 2014 PC meeting in advance of its deadline.}

11. Southwest Outage Recommendation 27
SAMS is reviewing an option to remand this work task back to the Operating Committee, the Operating Reliability Subcommittee, and the Real-time Application of PMUs to Improve Reliability Task Force (OC/ORS/RAPIRTF), as these groups have the necessary equipment and personnel with the operating experience to monitor angular differences across an interconnection and develop methods and guidelines for conducting seasonal and next-day operating plans that take into account reclosing of lines with large phase angle differences. This effort may also require coordination with the Synchronized Measurement Subcommittee (SMS).  
{Actions: Neil Burbure to discuss the above option with Bob Cummings. If agreed upon, John Simonelli will recommend that the PC remand this task back to the OC.}

12. Order No. 754 Status Update
Phil Tatro presented the status of efforts to meet directives in Order No. 754. Phil shared the current Order No. 754 team hypothesis that protective relays, dc control circuitry, and single station dc supplies without “full” monitoring present the greatest reliability risk of exposure to single points of failure. The team also believes that if standard development is deemed appropriate, the issue should be addressed within TPL-001-4 rather than in a new PRC standard (i.e., to avoid a prescriptive solution and allow flexibility in planning mitigation of possible single points of failures). The team also discussed three phase fault occurrences, consequences of the failure of protection systems during extreme events, a tiered approach to monitoring DC control circuitry, TPL-001-4 vs. a “TPL-007” type of standard for this effort, role of UFLS/UVLS, timelines for provision of data, support by SAMS, and when to expect reporting of results.  
{Actions: SAMS to continue supporting Order No. 754 activities.}

13. BES Exception Process
SAMS asked NERC staff the following questions regarding the BES Exceptions Process:
- What is the criteria for evaluation by NERC?
- What level of documentation is expected to identify elements as BES/non-BES?
• What level is documentation is needed? In other words, do we document taps, breakers, and other pieces of equipment that comprise a facility?

{Actions: SAMS coordinator to research the above questions and report back to SAMS via email.}

14. RAS Update
SAMS and MWG received comments from the RAS indicating that they are in agreement with the proposals for Southwest Outage report recommendations 5, 6, 7, 9, & NERC2. Chuck Chakravarthi noted that the LTRA was complimented by FERC.

SAMS was notified that proposed FAC-001-2 and FAC-002-2 are posted for comments until 8 p.m. on May 15, 2014 (Project 2010-02 Five Year Review of FAC Standards). In addition to the existing concerns that SAMS was monitoring, it was identified that the language in FAC-002-2, Requirement R3, to coordinate and cooperate on studies may create an issue in regards to how cooperation will be assessed during an audit. For instance, if a utility is unable to study an interconnection request, because of its position in their study queue, will this constitute a lack of cooperation with another entity who is ready to study the request now? SAMS was also unsure of what “Transmission Owner planning criteria” is referring to in FAC-002-2, Requirement R1, 1.2.

{Actions: SAMS will continue to monitor the efforts of the Development team.}

16. SAMS Review of SPS Standards Development
SAMS discussed the progress of Project 2010-05.2 – Special Protection Systems (Phase 2 of Protection Systems). A key point raised, was that the acronym SPS seems to create confusion over whether one is referring to a Special Protection System or a system protection scheme, so the drafting team may be looking at moving the industry away from the term Special Protection System and towards use of the term Remedial Action Scheme (RAS). The drafting team is also looking to clarify that prime mover governor and Automatic Generation Control (AGC) systems are not inappropriately characterized as Special Protection Systems. The team is also looking closely at the term “cascading outage” and its implications for the standard.

{Actions: SAMS to monitor standard drafting team efforts.}

17. NATF Update
SAMS received an update from Ed Ernst (NATF) on the status of various efforts underway at the NATF. Terry Crawley (Southern Company) volunteered to be a North American Generator Forum (NAGF) liaison to the NATF modeling practices group.

{Actions: Neil Burbure to post NATF presentation to April 2014 SAMS meeting web page.}

18. Distributed Resources - IEEE 1547 Standard Development
SAMS discussed the history of IEEE 1547 and the need to determine whether modifications are necessary for distributed resources to provide services such as frequency response, voltage support, etc. It was noted that manufacturers of inverter technologies associated with renewable resources are designing to IEEE 1547 standard requirements, even though groups of these inverters may be used for
larger commercial resource applications of 100 MW or larger. Additionally, it was indicated that IEEE 1547 addresses provision of frequency response and ride-through for frequency events, but that focus on voltage ride-through may not yet be contemplated by the standard. Bob Cummings noted that the standard is presently on a track for revision within 4 years and that this may not be soon enough to address changes in resources mix that are occurring now. Bob asked that SAMS support, monitor, and review the efforts of the IEEE 1547 revision team.

*{Action: SAMS to monitor, review, and support IEEE 1547 standard development efforts.}*  

19. Model Validation Field Trial
SAMS/MWG discussed the status of the Model Validation Field Trial and received an update that discussions between SAMS Leadership, SAMS coordinator, and NATF have resulted in 8 – 10 NATF members volunteering to support MWG model validation activities. Ed Ernst (NATF) indicated that NATF would begin working on the effort in June 2014.

*{Action: MWG to support NATF efforts.}*  

20. MOD-032 and MOD-033 Modeling Standards Update
SAMS discussed the possibility of holding a panel session at the 2015 IEEE meeting(s) to inform industry about future needs to comply with MOD-032 and MOD-033 and to work towards developing IEEE models that support these standards.

*{Action: SAMS to discuss need to conduct the panel session(s) and register before August 2014 to meet registration deadlines for 2015 meetings.}*  

21. Geomagnetic Disturbance (GMD) Update
Bill Harm (PJM) provided an update on the status of the GMD Standards Development and Task Force efforts. Bill also informed the group about a GMD technical conference taking place on May 20, 2014 to discuss TPL-007 and a benchmark GMD event in association with Project 2013-03 Geomagnetic Disturbance Mitigation.

*{Action: SAMS to re-schedule GMD presentation by Randy Horton to subsequent SAMS meeting.}*  

22. University of North Carolina Charlotte (UNCC) Presentation and Tour
Zia Salami (UNCC) provided a tour of UNCC facilities for supporting power system studies, governor model verification, and power system consulting. Zia Salami also presented the results of a study aimed at improving the models used for a generating unit in the Eastern Interconnection. The study found that a commonly used governor model does not account for governor deadbands as implemented by a power system software suite. As such, if this governor model is being used, it may overestimate frequency response that is provided by a given generating unit.

*{Actions: Zia Salami has agreed to attend and support SAMS meetings, when available. Neil Burbure to add Zia Salami to the SAMS roster and list.}*
23. ERAG MC Update
SAMS discussed ERAG efforts to move towards compliance with MOD-032-1 and MOD-033-1, PC creation of cases, future role of MMWG, how operational planning cases will be built after PCs begin supporting the construction of interconnection-wide transmission planning cases, accommodation of additional participants in interconnection case building versus the current tiered approach, EIPC’s role, and gaps that may be created when additional entities are included in the interconnection-wide case building processes.

24. Eastern Interconnection Frequency Response capable powerflow and dynamics models and IFRO dynamics testing
NERC staff explained role of SAMS in supporting development of powerflow cases and dynamics models that allow proper analysis of frequency response in the Eastern Interconnection.

25. Next Meetings/Conference Calls

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<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Primary Purpose</th>
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<tr>
<td>August 26-28, 2014</td>
<td>Tuesday half day</td>
<td>Eagan, MN (MISO Offices)</td>
<td>Regular meeting</td>
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<td>September 30 –</td>
<td>Two days to be decided</td>
<td>Denver, CO (Xcel Energy)</td>
<td>Technical Conference</td>
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<td>October 28-30, 2014</td>
<td>Tuesday half day</td>
<td>Salt Lake City, UT (WECC) /</td>
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<td>Pomona, CA (SCE) – Need to verify</td>
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<td>space until 60 days prior). Amos Ang</td>
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<td>to check on SCE availability in Pomona.</td>
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<td>January 27-29, 2015</td>
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<td>Tampa, FL (FRCC Offices) - Need to</td>
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<td>Andrew Arana</td>
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<td>April 28-30, 2015</td>
<td>Tuesday half day</td>
<td>Springfield/Holyoke, MA (ISO-NE</td>
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<td>August 18-20, 2015</td>
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