

Minutes

ERSTF Working Meeting

October 29, 2014 | 9:30 AM – 5 PM EST
October 30, 2014 | 8:00 AM – 12:00 PM EST

NERC Atlanta Offices – Room Number 611
3353 Peachtree Road NE, Suite 600
North Tower
Atlanta, GA 30326

Remote Login information: Please use both web and phone logins if you are joining us remotely.

Web: www.readytalk.com | Access: 5494366 | Security: 141029

Phone: 1-866-740-1260 | Access: 5494366 | Security: 141029

Attendees:

Remote: Ron Carlsen, Jay Roberto, Ed Scott, David Blackshear, Mark Ahlstrom, Rich Hoag, Alfred Corbett

In-Person: Ken McIntyre, Brian Evans-Mongeon, Todd Lucas, David Canter, Mike McMullen, Jason MacDowell, Sam Holeman, Mani Mardhekar, Dave Devereaux, Clyde Loutan, Rich Hydzik, Julia Matevosjana, Pooja Shah, Amir Najafzadeh, Ganesh Velumylum

NERC Antitrust Compliance Guidelines and Public Announcement – Completed by P. Shah

Introduction and Chair's Remarks – Ken updated the group on the status of the TF since the September face to face meeting and the intent behind this meeting. The intent is to develop the required measures for monitoring those changes due to the changing resource mix and technologies that are penetrating the tradition mix of resources. These measures can be at an Interconnection, RC or BA level, as required. The goal for this meeting is to decide which measures presented by the sub-groups we wish to proceed with formally, and those which need more investigation/analysis.

Tom Burgess (NERC) Update – Tom Burgess commented that NERC board members at the September committee meetings appreciated the level of work and efforts being put forward by the task force. He commented that the Phase 2 deliverables are specific with strong measures along with technical analysis to support the measures. Tom also mentioned that NERC is close to getting a MOU with IEEE. This MOU would allow for syncing of some standards to address these changing trends, especially because IEEE standards are equipment oriented.

Agenda Items

- 1. Update from September Face to Face Meeting** - Brian updated the group on the status of the report. In September, the OC had expressed major issues with the document not referencing the IOS document from 2002, and asked ERSTF to implement appropriate references and also to consider combining Load & Resource Balance and Frequency Support into one for the concept paper. Brian announced that OC endorsed the modified Concept Paper via email. The PC was notified of the changes to the document, since PC endorsed the paper at September meeting. Ken

mentioned the presence of NERC board members at the last meeting and the work of the task force was well received by them. Brian reminded the group about concern that was brought up at September meeting regarding non-NERC generators, demand response, and distributed PV (specifically for CA). Clyde talked about issue with maintaining CPS standards and not being able to demonstrate issues with distributed PV, etc. CA relies on interconnection flows during sunrise and sunset, however it's not sustainable. Their issue is with lack of visibility and dispatchability which is not what state regulators observe. CA needs flexibility capacity.

Frequency Support Subgroup Update & Discussion – Hassan Julia, Pooja, Jason – The Frequency Support group came up with three options, two operational and one planning. Julia presented ERCOT's data and mentioned that lower inertia on the system poses risk. Texas now faces a new challenge with difference in characteristics of coastal and non-coastal wind power. Julia

Matevosjana (ERCOT) presented box plots for inertia trends in ERCOT. Kinetic energy is calculated as $H \cdot MVA$ of each online synchronous generation on an hourly basis. She also looked at wind generation and its capacity factors of the same time. She showed peak wind penetration hours and what was happening during those particular hours. 2014 has the lowest inertia at wind peak. Julia projected this out into the future for three years based on the interconnection queue. Potential coal generation retirements could exacerbate this issue as the coal units are replaced by natural gas units, in addition to the intermittent and non-synchronous technologies. Kinetic energy drops to approximately 50-60% of what it is today. The Task Force agreed that this measure was informative and captured the potential impacts of changing inertia provided by synchronous machines.

Pooja Shah presented CAISO's data for min and max inertia used for SCIT currently. This is required to maintain transient stability on the southern California system. Clyde discussed how CAISO uses this data in PI processor to produce a real-time parameter and is monitored with dynamic limits based on voltage stability and transmission overloads. If this parameter gets close to the limits, operators take action. The task Force agreed that the sub-group should continue to pursue this option, since this presents a real-time tool that the operators may utilize for situational awareness, and in their decision making process when deciding to take action.

Jason MacDowell presented GE's preliminary study results on Western Wind and Solar integration study. The study used three options: 1) current renewable mix, 2) future mix almost double the amount of renewables today, and 3) all the concentrated solar power (CSP) being replaced with PV. The frequency decline shows the reduction in inertia when base load resources are replaced with non-inertial producing resources.

The group decided to make ROCOF or $(1/\text{inertia})$, frequency nadir, frequency deviations, and real time inertia for an interconnection (CAISO's tool) four measures to be studied under this subgroup for this deliverable. ERCOT was offered help by CAISO, MISO.

2. Load and Resource Balance Ramping Subgroup Update and Discussion – Clyde – Clyde presented his findings on flexibility needs, which are not based on intra-hour markets. Currently their max ramp during low loads is 8000 MW, and their mix is all transmission level solar, since CAISO has no visibility into distributed PV. CAISO believe renewables could be part of the solution for their issue, if they only have visibility and control capabilities. Ken mentioned that in ERCOT wind is dispatchable. The group agreed that concept of ramping and/or flexible capacity could be

presented using box plots as well (similar to the inertia measure presented by the frequency subgroup). ERCOT, MISO and Ontario will help CAISO with the plots and data behind them.

3. **Voltage Support Subgroup Update and Discussion – ~~Team Member~~ Jason & Ken** – Ken mentioned he had conversation with John Simonelli about dynamic and static measures to monitor reactive needs for local areas. There was discussion around smart inverters for distribution connected resources. Germany is facing the same issues and there was consensus on referencing their studies. It was presented that the Voltage subgroup has a meeting scheduled for the week of November 3rd and they are planning to discuss some potential measures for the Task Forces' consideration.
4. **Policy and Advisory Subgroup Update and Discussion – Dave Canter** – Dave confirmed the Task Forces decision in Vancouver to have three progressive documents. As a results of the first day of this meeting, this subgroup will be used to inform and educate other Task Force members and the OC and PC on the matters discussed in the meeting. The objective to get the OC and PC to endorse the next steps at the December meeting and therefore, the subgroup will help in the development of materials to be distributed to those involved.
5. **Materials/talking points for November Board of Trustees Meeting** – Ken mentioned that the board members OK'd a verbal update at the September meeting. Brian and Ken will attend the board meetings.

Next steps for December ERSTF Meeting – Atlanta, GA 12/10-11

- Present at OC and PC
- OC/PC meetings may drive the ERSTF meeting
- Next steps in 2015, such as data collection, analysis, etc.
- What are the distributed PV issues in Germany?
- IEC standard regarding interconnections
- IVGTF report is due in November

6. **Thursday Update** – Pooja Shah presented the group with phase 2 deliverable document and asked for group's input. This effort led to developing a strong platform for the subgroups to start documenting the technical analysis and results. Dave Canter's group would be able to use key assumptions and challenges to highlight the findings and assumptions. The following was incorporated in the report document template. The group discussed the need to push through the next few weeks and produce the promised deliverables to OC and PC. Sam Holeman mentioned that some OC folks may need to be individually updated on what this group has found and is going to present to OC. Same thing for PC. Pooja Shah offered to hold a conference call with online ready talk to present, if needed. There was a mention of possible questions, one of them was at what level is my system is in trouble. This is a hard question to answer because of all tails associated with it.

Discussion on the term metric and measure. The group landed on 'measure' for time being. Each Measure will have description, information benefit, measure assumptions, key findings and challenges documented.

Measure 1– Box Plot showing Inertia (kinetic Energy). This data would be historical and a three year projection, intended for the planning horizon. This is a BA level measurement. Task Force decided to move forward with this measure and formally recommend to OC/PC in December.

Measure 2 – Frequency Deviations RoCoF – This is a summation of the BA Measure 1 data used to calculate RoCoF for an interconnection, intended for planning horizon. Task Force decided to move forward with this measure and formally recommend to OC/PC in December.

Measure 3 – Frequency nadir – This measure needs further analysis by sub-group before formal recommendation. Intent for measure would be operations horizons, up to next day analysis.

Measure 4 – CAISO model on inertia with voltage stability limits - This measure needs further analysis by sub-group before formal recommendation. Intent for measure would be operations horizon for operators in real time.

Measure 5 – Ramping Needs Capability – Ramping needs will be evaluated for one hour upward and downward ramp as well as three hour upward and downward ramp, for three scenarios: Current, and three years out. For Box plots the group decided to study two options for confidence in the model, 25-75% and 95-5%. Task Force decided to move forward with this measure and formally recommend to OC/PC in December.

The task force is planning to circulate the draft document for Phase 2 deliverable with the agreed measures and their respective status once it is ready for recommendation or if further analysis is needed.