NERC Committee Report

Terry Bilke, MRO Rep on NERC Resources Subcommittee

Date: October 28, 2016

To: Midwest Reliability Organization Operating Committee

From: Terry Bilke, MISO

Subject: NERC Resources Subcommittee Report

Action: No

The North American Electric Reliability Corporation (NERC) Resources Subcommittee (RS) met October 26-27 at South Carolina Electric & Gas’ facility on Sullivan’s Island, SC. The complete meeting package is posted on the RS website. The following are highlights:

- The Frequency Working Group (FWG) selected events from July through September to be used for the BAL-003-1 (Frequency Response). The events will be posted on the Balancing Authority Submittal Site (BASS). Information on the site can be found here. Reviewed a case where over 1100MW of solar generation was inadvertently lost due to a controls issue triggered by a nearby fault.

- The RS passed a resolution to thanking Larry Kezele on his upcoming retirement for his service to NERC, the RS and the industry. Larry is the second most senior person in tenure at NERC.

- NERC has made tweaks to the FRS Forms 1 and 2. BAs will need to make sure they are using the appropriate BAL-003 forms when submitting 2016 operating year data in 2017.

- The RS discussed a recent case where a Balancing Authority set its governors to NERC’s guidelines and experienced an issue following a large frequency event in the West. The BA did not look at the ramp rate associated with their governors, which tried to respond greater than the boiler could follow. NERC will be issuing a lessons-learned on this.

- NERC is looking to create a dispersed generation resource task force to determine if there are gaps in the standards.

- ERSTF Report was posted, comments were due October 28.

- Reviewed ERSTF system inertia data being collected by all Interconnections for June through August. The East and West should not experience issues due to low inertia for the next several years.

- Lin Franks (IPL) gave a presentation on their use of battery energy storage for primary frequency response.

- Terry Bilke presented an update on work with the University of Tennessee-Knoxville’s Rate of Change of Frequency (ROCOF) tool in FNet. The primary progress is an alert of possible low inertia sent with emails sent via UTK’s notification system. Additionally, the ROCOF data should help the ERSTF effort. An annual regression of rate of change vs. loss size would be a useful performance-related measure correlated to interconnection inertia.
• Discussed a proposed ERSTF metric related to ramping, which proposes to tally cases where hourly BA CPS1 < 100% for over 3 consecutive hours.
• Discussed the general uptick in the number of fast time error corrections (TEC) in the East since May. Part of this is caused by BA doing unilateral payback of inadvertent that had been accumulated over the years.
• Francis Monet from HQ gave a presentation on a smart load application they developed to control load to regulate frequency. HQ uses water heaters as the primary smart load. They install frequency sensors on the water heaters that can modulate load (not just turn it on and off) in < 250 ms. They plan to use this for primary frequency response, frequency regulation, cold load management, contingency reserve, and demand side management. Deployment of most of these services is automatic based on local sensing of frequency. They have “on demand” interruption by wifi or by slightly adjusting frequency in AGC. Software setting changes can be done via wifi. This is currently a research project using 5 water heaters. The next step is a pilot project based on a few hundred heaters.
• Tom Pruitt from Duke gave a presentation on their experience related to distributed energy resources (DER). Duke has 969 MW of DER, mostly solar, about a quarter is behind the meter. While Duke serves both North and South Carolina, all the DER is in North Carolina as that state offered incentives to DER. They have nearly 6,000 MW in queue. They use telemetry for sites > 250kW. They aggregate DER hourly by fuel type. Their DER experience is that these resources operate negatively during system events. They see a need for storage (e.g. batteries, pumped storage). Expecting to see problematic minimum load periods in the afternoons during non-peak seasons. Adding protection systems are being added to keep these resources off-line during islanding and restoration. They are adding the DER to their model so they capture variability of load and DER separately to improve their state estimation and RTCA.
• BAL-003 SAR. This issue came about because this year’s frequency analysis showed an improvement in the East’s performance but the B-C adjustment in the standard would increase the East’s FRO for 2017. Terry Bilke noted that the attachment in the standard doesn’t require an annual recalculation of IFRO and that it appears that the issue could be addressed by an errata change to the standard as opposed to a SAR. The issue with a SAR is that drafting teams can get bogged down or add things to the standard that was never envisioned. The RS agreed to a motion to allow the RS chair to work with a team to draft proposed errata or a very targeted SAR.

• Generator Survey. The NERC OC agreed to allow the RS conduct a series of 3 generator surveys next year to capture governor response information for specific events. There will be a webinar before the surveys are conducted.

• Synchronous Inertial Response sufficiency. Julia Matevosjana from the ERSWG gave a presentation on the group’s approach to measure sufficiency. The approach is to calculate inertia for the year, choose the low point for the year, and determine what the rate and change and depth of frequency for a large contingency under these conditions. If this point would encroach on UFLS, the issue is flagged. In these cases, mitigation approaches are determined (increase reserves, change dispatch, etc.). The working group is also proposing a method to forecast inertia based on renewable penetration changes.

• ACE Diversity Interchange (ADI) Guidelines. The RS was charged with creating this guideline. In general, ADI works among a pool of BAs that agree to share some of the diversity of ACE. Terry Bilke’s primary concerns with the document are the compliance loopholes. As written, BAs could use the algorithm to swing all BAs through zero once every 15 minutes, thus guaranteeing that the participants would never have a DCS or BAAL violation. Additionally, the document did not require saving raw (pre-ADI) ACE for audit validation. The drafter agreed to make the proposed changes. The guidelines were approved.

• FERC NOI on governors. FERC staff reached out to the RS chair to discuss a series of technical questions with regard to control settings and governor changes. A call was held with the RS Frequency Working Group and the executives of the NAGF as well as some major governor and distributed control systems manufacturers. It is expected FERC staff will used this information on decisions regarding the NOI (NOPR, Order, etc.).

• Terry Bilke provided frequency performance data for the Eastern Interconnection. There was an uptick in one-minute frequency noise coincident with the implementation of the 2016 Bias Settings. Additionally, there has been a shift in average frequency since late May that has caused an uptick in Time Error Corrections. Performance is still better than 2002-2014. See appended graphs.

• The next RS meeting is January 25-26 at San Antonio Public Service in San Antonio, TX.
Daily RMS1 Grouped by Week
Week 26 Bias Change, week 36 Average Frequency Deviation Increase

Tests are performed with unequal sample sizes.