IEEE PES DSASC Test Feeder Working Group

Minutes

Meeting on July 24th, 2012
2012 PES General Meeting, San Diego, CA

A formal meeting of the DSASC Test Feeder Working Group was held at 2012 PES General Meeting. Seventeen participants were in attendance:

Attendee	Affiliation
Aleks Dimitrovski	Oak Ridge National Laboratory
Larry Trussell	GL Group
Mesut Baran	NC State University
Michael Kleinberg	Drexel University
Greg Shirek	Milsoft Utility Solutions
Barry Mather	National Renewable Energy Laboratory
Kevin Schneider	Pacific Northwest National Laboratory
Karen Butler-Purry	Texas A&M University
Roger Dugan	Electric Power Research Institute
Sukumar Brahma	New Mexico State University
Jignesh Solanki	West Virginia University
Sandoval Carneiro Jr.	Federal University of Rio de Janeiro
Kevin Jones	GL Group
Sarika Khushalani-Solanki	West Virginia University
Luis Ochoa	University of Manchester
Ebony Mayhorn	Texas A&M University
Jason Fuller	Pacific Northwest National Laboratory

The Institute of Electrical and Electronic Engineers, Inc.

Action Items

1. Jason to follow-up on 2nd NEV test case and get it posted to website.
2. Jason to organize and post results on S.C. analysis cases on the website.
3. Jason to work with Tom M. to get DG protection case organized and posted to the website.
4. Greg (possibly) to look at a more complicated S.C. test based off of Comprehensive Test Feeder.
5. Barry agreed to share his 34-node test case and paper with the group. This will form the basis for the Inverter DG test case and the time-series test case. Kevin volunteered to work with the time-series test case.
6. Mesut also has been doing some work that may be applicable to inverter DG case and will share a write-up.
7. Sandoval to see about finding another student to finish up 80-node mesh system.
8. Luis suggested a new LV test case and would share a model and results with the group for approval.
9. From these notes, Jason is to start developing a new road map for the WG.

Contact Information

Working Group Chair: Roger Dugan (rdugan@epri.com)
Working Group Secretary: Jason Fuller (jason.fuller@pnl.gov)
Working Group Website:http://ewh.ieee.org/soc/pes/dsacom/testfeeders/index.html

Test Feeder Working Group Meeting Minutes

1. Roger discussed the progress of current models. Many are completed, but Jason needs to organize and post to the website. Also mentioned that the group had somewhat stagnated over last year, and hoped folks would become more active in next year.

The Institute of Electrical and Electronic Engineers, Inc.

2. Roger discussed PSACE WG which is working to actively collect and correlate test cases for all subcommittees / TFs / WGs. Roger will likely take over as chair for that WG and will step down from chair of DSAC Test Feeder WG.
    a. Roger nominated Jason to become new chair. No objections.
    b. Jignesh volunteered himself or one of his students to become the new secretary.
3. Roger discussed current state of 2009 Road Map for the WG.
    a. Neutral-Earth-Voltage cases – There are now two completed and validated cases. Only one has been posted to the website. Jason to follow up to get the second posted.
    b. Short Circuit benchmarks – Roger hosted T&D panel on results from the original radial test feeders; Roger and Bill able to match results within 1 A (on 14,000 Amp fault) except in one case which has been satisfactorily explained in Roger's paper; Jason able to confirm to within 1% for all results except the 34-node feeder; Jason to post confirmed results and link to paper on website.
    c. Distributed Generation Protection – Tom McDermott has finished the case and paper has been written; Jason needs to work with Tom to get results formatted and posted to website and link to paper.
    d. Large System Model – 8500 node completed and posted; some external folks have been talking about creating a 30,000 and 800,000 node test system.
    e. Comprehensive Test Feeder – only WindMil folks have been able to create the model (time constraints for most participants, rather than ability to do so); Greg would like to see this used as the short circuit test case as a more complicated case rather than the original feeders which are a little too simple – Jason suggested a smaller subset of that feeder to simplify the case and get other participants – Greg was supportive of this, but did not want to "water down" the case too far, as it should be a test of the tools ability to perform.
    f. Inverter Based DG model – has not been completed; needs to include power flow, short circuit, and dynamics; Mesut mentioned they had

been doing some work in this area and Roger asked him to write-up what had been done; Barry did some work with 34-node test system which included solar PV – Roger asked him to share paper and model with the group to create a test case – Barry tentatively agreed (with help) – Kevin volunteered to participate.

g. Asymmetrical Contingencies – little has been done on this case; would we like to add dynamics?

h. Time-Series Benchmark (not on 2009 Road Map) – much time was spent discussing what this would entail – summary of conclusions:
   i. Use one of the existing feeders – 34-node was suggested
   ii. Regulator / capacitors need to have reasonable operational modes and time delays added
   iii. Start with the standard feeder and add standard loadshapes and possibly PV "shapes"
   iv. 1-min v. 1-sec timesteps discussed; one-second was decided as most regulator operations less than one minute
   v. On OpenDSS Sourceforge website, 1-sec cloud transient data has been posted
   vi. Minimally capture:
       1. Regulator taps as a time-series
       2. Capacitor positions as a time-series
       3. A few nodes (2-3) capture a time-series of voltage
       4. A few time periods (2-3) capture a snapshot of entire system voltage; suggested during on-peak, off-peak, and initialization
       5. Total tap changes and cap switching operations throughout time period.
   vii. Barry would start process by sharing his 34-node model with the group.

i. Mesh Network (not part of 2009 Road Map) – Roger's very large system still does not have a picture and is not quite ready to share; Sandoval's student quit so the 80-node model is not quite ready; Sandoval's model is probably closer to completion than Roger's.

    j. Luis suggested a low voltage case (new) – European style; currently there is not one in the WG; Luis was volunteered to share a model/solution with the group

    k. Microgrid test model (new) – both PNNL and EPRI have had a number of requests; discussed whether this was the purview of this WG – decided yes; Roger mentioned that Connecticut has mandated utilities to develop ~2 MW microgrids for weather-related outages; it was decided that dynamic modeling was probably necessary; Jason to sketch out a microgrid test model road map and share with the group

4. A question came up about how representative the test feeders were towards all North American feeders; Roger replied that they were not necessarily representative of all feeders in North America as they came from the Southwest but they did come from actual utility models; pointed folks towards EPRI's open release of 3 feeders and PNNL's taxonomy of prototypical feeders, all of which are also actual utility feeder models and probably more representative of North American systems as a cross-section; a link has been posted on the web site pointing towards those resources.

5. Roger discussed with Jason the need for a new WG road map (comparable to 2009 version) – Jason to develop a straw man from meeting notes and share with group for approval – could possibly be a part of 2013 GM panel session.

The Institute of Electrical and Electronic Engineers, Inc.