



Power Systems Engineering Research Center

Improving Economic Dispatch through Transmission Switching: New Opportunities for a Smart Grid

Kory Hedman and Shmuel Oren
University of California at Berkeley

(Based on joint work with Emily Bartholomew Fisher,
Richard P. O'Neill and Michael C. Ferris)

June 9, 2009
2:00-3:00 p.m. Eastern Time (11:00-12:00 p.m. Pacific)

Description: Traditional security constrained economic dispatch of electricity resources treats the transmission network as a fixed static topology while optimizing deployment of generation assets. However, it is well known that the redundancy build into the grid in order to handle the multitude of contingencies over a long planning horizon can in the short run create congestion and necessitate costly out of merit dispatch. While it is quite common for operators to occasionally open lines that reach their thermal limit, such practices are employed on an ad hoc basis and are not driven by cost considerations. The objective of our work is to explore, from an economic perspective, the potential of treating the grid as a flexible topology that can be co-optimized along with generation dispatch, subject to reliability constraints, so as to minimize the cost of serving load.

This talk will review recent work by the authors demonstrating that optimizing the network topology with generation unit commitment and dispatch can significantly improve the economic operations while maintaining the traditional "N-1 reliability" standard. Our analysis also provides an assessment of potential economic gains from smart grid technologies that will enable of the N-1 reliability standard in favor of new reliability concepts such as "just in time N-1 reliability". Test results based on a DC OPF analysis are presented for the IEEE 118 bus model, the IEEE RTS 96 system and the ISO-NE 5000 bus electric grid.

Speaker Contact Information

Shmuel Oren, University of California at Berkeley
Email: oren@ieor.berkeley.edu
Phone: 510-642-1836

Participation by Webcast: You can participate in PSERC tele-seminars via webcast. Before the tele-seminar, [click here](#) and then on 6/9/09 when the status is "In Progress." Note that the web page at that address does not automatically refresh. The webcast will include the audio and the slides so you will not have to download the slides in advance. If you want to ask questions, you should register for participation by phone.

Registration for Webcast Participation: None required. There is no charge for participating!

Participation by Phone: Live audio will also be provided via a teleconference phone bridge. After registering, you will be sent connection information for the conference phone bridge. You

will need to download the presentation slides in advance of tele-seminar. The presentation slides will be posted on June 9 on the [PSERC website](#). The archived audio-slide production of the tele-seminar will be available for [webstreaming](#) after the tele-seminar.

Registration for Phone Participation: To indicate that your organization would like to have a phone access line, send an email to Theresa.Herr@asu.edu with the subject "Oren Seminar". To use our limited phone bridge capacity efficiently, we ask that people within an organization participate together rather than calling in separately, if at all possible. Connection information will be sent before the tele-seminar. There is no charge for participating!

Professional Development Hour Certification: PDH certification is available for PSERC members (only). Send an email requesting PDH certification to Theresa.Herr@asu.edu with the subject "PDH" after the seminar. *Include the name and title of each participant.*

Tele-Seminar Logistics and Assistance

Connection information will be emailed to you about three business days before the tele-seminar. If you have any questions, please contact Theresa Herr, PSERC's administrative assistant, at 480-965-1643 or Theresa.Herr@asu.edu. You can also contact Dennis Ray, PSERC Executive Director, at 608-265-3808 or djray@engr.wisc.edu.

PSERC's Tele-Seminar Coordinator

Shmuel Oren, University of California at Berkeley
Email: oren@ieor.berkeley.edu

Shmuel welcomes feedback on the tele-seminars and suggestions for future ones.

Dennis Ray
Executive Director
Power Systems Engineering Research Center (PSERC)
"Empowering Minds to Engineer the Future Electric Energy System"
608-265-3808
<http://www.pserc.org>

Find potential student job applicants at [PES-Careers](#).