



VIRGINIA MOUNTAIN SECTION NEWSLETTER

IEEE Region 3, Council 09, Section 65

January 2005

Thursday, January 20, Clarion Hotel Roanoke Airport

Blackouts and Hidden Failures in Power Systems

Dr. James S. Thorp

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Abstract

An overview of the large electric power system will be followed by a discussion of some of the mechanism involved in large blackouts. The concept of a "hidden failure" in large systems including the power system and the Internet will be explained. A "hidden failure" is a defect in the system which is not immediately visible but which under stress will result in a small disturbance cascading. The role of hidden failures of protection equipment in previous large system disturbances from the 1965 Northeast blackout to the August 14, 2003 event will be presented. Some data from the August 2003 event will be presented along with a 70 second animation prepared by the New York Independent System Operator (NYISO) of the blackout of New York State on August 14.

In conclusion, historical data of major blackouts will be compared with earthquake, flood, and forest fire data to suggest that large system events are governed by common physical laws. The implications of these observations on our ability to control large disturbances will be discussed.

Speaker Bio

James S. Thorp is the Hugh P. and Ethel C. Kelley Professor of Electrical and Computer Engineering and Department Head of the Bradley Department of Electrical and Computer Engineering at Virginia Tech. He was the Charles N. Mellowes Professor in Engineering at Cornell University from 1994-2004. He obtained the B.E.E. in 1959 and the Ph. D. in 1962 from Cornell University and was the Director of the Cornell School of Electrical and Computer Engineering from 1994 to 2001; a Faculty Intern, American Electric Power Service Corporation in 1976-77; and an Overseas Fellow, Churchill College, Cambridge University in 1988. He was an Alfred P. Sloan Foundation National Scholar and was elected a Fellow of the IEEE in 1989 and a Member of the National Academy of Engineering in 1996. He received the 2001 Power Engineering Society Career Service award.

He was the Chair of the National Academy of Engineering Peer Committee on Electric Power/Energy Systems in 2000, the Chair of the Subcommittee on System Protection of the IEEE Power System Relay

Committee from 1998-2001 and is member of the University of Wisconsin Electrical and Computer Engineering External Advisory Committee. He was the Editor of the IEEE Transactions on Power Delivery for protection systems, a Member of the International Advisory Board of the Department of Electrical and Electronic Engineering, Hong Kong University, and a member of the Iowa State ECE External Advisory Board. He is the Co-Author (with A. Phadke) of *Computer Relaying for Power Systems*, a number of book and encyclopedia chapters, and more than 100 journal articles. He has taught short courses in Computer Relaying both nationally and internationally. He is interested in the protection and control of large-scale-power systems including algorithms for digital protection, adaptive relaying, and the complicated dynamic behavior of the power system.

Date: Thursday, Jan. 20, 2005

Reservations by

5 PM Monday January 17

Dr. James Squire (540) 464-7548

<mailto:squirejc@vmi.edu>

Please specify number of attendees

Time

Social: 6:30 PM

Dinner: 7:00 PM

Talk: 8:00 PM

Cost:

Member/ Guest \$15.00

Student \$ 8.00

Directions to Clarion Hotel

2727 Ferndale Drive NW

1581 Exit 3 Hershberger Rd West

1st Rt. onto Ordway Drive,

¼ mile, Rt. Into Parking Lot.

Virginia Council Rep Needed

The Virginia Council of the IEEE represents the four Sections in Virginia. The position of Virginia Council Representative from the Virginia Mountain Section is now open.

The purposes of the Council are to improve communications among member sections, co-ordinate Section activities, promote statewide activities, stimulate member participation in the IEEE, enhance the status of membership in the IEEE, and provide a strong, united voice from the member Sections to the Regional and National governing bodies of the Institute.

Members serve two-year terms, staggered with respect to the Region 3 officer terms. Region 3 represents all IEEE members in the nine states east of the Mississippi, from Virginia to Florida. Jamaica is also part of Region 3. The Council meets four times per year, twice by e-conference and twice face-to-face. Face-to-face meetings rotate around the state. The next meeting will be in Williamsburg on March 5, 2005.

The four Virginia Sections include Central Virginia (Charlottesville and Lynchburg), Hampton Roads, Richmond, and Virginia Mountain. Each Section sends one representative to the Council. Section Chairs are also

Council members. Offices rotate among the Sections. For 2005 the officers are: Chair-Richmond, Vice Chair-Hampton, Secretary, and Treasurer-Virginia Mountain.

The Virginia Council is a partner with the Northern Virginia Section, part of Region 2, in the Virginia Co-ordinating Council. This body provides a means for all IEEE Virginia members to work together. One of its primary activities is communication with state government, together with other state engineering organizations, on matters of concern to all engineering disciplines.

Among the statewide projects currently before the Council are support for the Boy Scout Jamboree, held in Caroline County, VA at Fort A. P. Hill from 25 July 2005 to 3 August 2005. IEEE has supported training sessions for the Electricity and Electronics Merit Badges at the Jamboree Since 1981. Visit www.emeritbadges.org for more information on this exciting project.

The Council also has designed and built an electricity demonstrator for use by pre-college educational groups in demonstrating the effects and uses of electricity. This has been successfully used at Girl Scout meetings and at the Childrens' Engineering conference each year in Richmond.

The major project now before the Council is organizing SOUTHEASTCON 2007. This regional conference will be held in Richmond in the Spring of 2007.

More about the Council, its members and activities, can be found at its web site, <http://ewh.ieee.org/r3/vc/>.

If you would be interested in serving on the Council as the representative from Virginia Mountain Section, or as a committee chair, please contact Past Council Chair Dave Geer, d.geer@ieee.org, or Virginia Mountain Section Chair, Cy Harbourt, cdharbourt@ieee.org

The following Officers and Chapter Chairs for 1995 were elected in December, and will be inducted at the January meeting.

VMS OFFICERS

Chairman: Cy Harbourt
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mailto:dain_miller@ieee.org

COMMITTEE CHAIRS will be appointed in January. These include
VA Council Representative
PACE

Publicity
Student Activities
Awards

Membership Development
Please let Cy Harbourt know if you are interested in any of these positions, or require further information.

NEWSLETTER

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