



Power Factor and Harmonics

Keith H. Sueker, P.E.



The use of power electronics equipment has often put the user in the position of having to meet strict power company limits on harmonic currents and to pay attention to avoiding or minimizing power factor penalties. Yet these two items are not always well understood by those responsible. For example, did you know there are two kinds of power factor? Or why do power factor correction capacitors sometimes cause damaging harmonic overcurrents? This program will explain the basics of both power factor and harmonics and will explain workable measures to assure conformance to standards. It should be helpful to most engineers working with power electronic equipment. A reference booklet will be supplied.

Mr. Sueker has designed high power harmonic mitigation filters for industrial clients and has conducted tutorials on harmonics at national IEEE/IAS meetings. He holds an M.S.E.E. (1950) degree from Illinois Institute of Technology and is a Professional Engineer in the Commonwealth of Pennsylvania. Mr. Sueker has forty years of experience in power electronics and is currently working with Curtiss-Wright Electro-Mechanical Company on electromagnetic aircraft launching systems for carriers.

Place: Westinghouse Energy Center, Monroeville
Date: February 5th
Time: 6:30 PM – Social , 7:00 PM – Program

Reservations are required for your attendance. If you have questions or you would like to RSVP, please contact Charles Baker at (412) 374-5425 or by email at bakercf@westinghouse.com by January 30th.

Directions: From downtown Pittsburgh, take the Parkway East Outbound to Exit 14A (Monroeville). Cross the traffic light (Business 22) and proceed on Rt. 48 South for two traffic lights. Turn left onto Northern Pike. Proceed East ~ 0.2 miles and turn right at the first traffic light onto Westinghouse Drive. Travel 0.7 mile to the three flags where the main entrance is located. Parking in the evening will be plentiful in the large area in front of the building. Enter the main entrance. Check with the security inside. You will be directed to the proper auditorium for the presentation.

From PA Turnpike, take Exit 57 (Monroeville). After the toll plaza, get in the left lane (Business-22). At the first light, turn left on to Rt. 48 South and follow the directions shown above.

Pittsburgh Section News

The following officers were elected at the January 2004 Executive Committee (ExComm) meeting. The officers will serve through December 2004. Thank you for offering your time to help make our organization better.

Chair: **Elena Schreiber**

Vice-Chair: **Kalyan Sen**

Secretary: **John Twigg**

Treasurer: **Ralph Sprang**

The Pittsburgh Section is considering publishing *The Bulletin* in electronic format only. In the past, the section was required to provide a hardcopy advertisement of section meeting notices to all of its members. This requirement has been changed, and accordingly, the section will be discussing how to transition over to electronic only format. Hardcopy publication of *The Bulletin* is extremely costly and is the single largest expense to the section (over \$7000 annually and increasing ever year). IEEE now requires the section to send one mailing a year to all members with the following information:

How to update membership data in the IEEE master database. www.ieee.org/coa

How to subscribe to the section email list. Send email to m.boccabella@ieee.org

Link to the section's web page. www.ewh.ieee.org/r2/pittsburgh

The ExComm will be discussing this issue over the next several months. If you have objections or wish to discuss this further, please attend one of the upcoming ExComm meetings, or send your concerns to the Section Officers as listed on the next page. This is a great opportunity to get an IEEE email alias if you have not done so yet. An alias will give you a permanent email address (as long as you are an IEEE member) so if your internet service provider changes, or your job changes, your email will be the same. Additionally, all email sent through the IEEE servers is scanned for viruses to protect the members.

Also, the ExComm would like to welcome Mike McCloud as the new chair for the Signal Processing Society. He will be taking over for Pat Loughlin who has chaired the section for the last several years. Thanks for all of your work in the past Pat, and we welcome Mike.

Upper Mon Sub-Section News

The Upper Mon sub-section is sponsoring a Computer Forensics seminar on February 16th, and a Propulsion seminar on February 23rd. Both seminars are at 4:00 PM. Please contact Matt Valenti at mvalenti@wvu.edu for more information.



Preparing for Your Major Career Changes, Voluntary and Forced Occurrences

Nigel P McQuin

Electrical Power Consultant



During the course of the careers of virtually every single professional, voluntary and forced occurrences of changes will transpire. These can be pleasant experiences of new hope and opportunity for the future, or they can be devastating events that shake you to the very core. The effects can cause major upheavals in your life, including the complete relocation and re-settling of your whole family. All previous connections and acquaintances can be severely strained, and financially major hardship may be experienced during a period of transition. During such events the preparation and structure of your whole career strategy can have a profound effect on your response, and the survivability, to the change process.

Mr. McQuin who has had personal experience of several major career changes, family relocation and being laid-off, will discuss this important subject. The elements of a successful career plan will be developed, which will stress the importance of professional networking, financial planning, family and community support. Advice will be offered on how to be prepared to handle the company downsizing or relocation announcement, and how to come out of this situation with a new sense of hope in your career.

Place: Benedum Engineering Hall, Room 1175, Univ. of Pittsburgh
Date: February 18th
Social: 6:30 PM
Program: 7:00 PM

If you have questions or you would like to register, please contact Dr. Kal Sen at (724) 696-1611 or by email at senkk@iee.org by February 11th. **Please note: The location and the contact person for this meeting has changed.**

Technical Society Mixer

The IEEE Pittsburgh Section will be participating in a Technical Society Mixer hosted by the Engineering Society of Western Pennsylvania (ESWP) on March 3rd from 5:30 PM to 8:30 PM. If you are interested, you can find more information at www.eswp.com or contact David Teorsky at d.teorsky@eswp.com.



Advanced Meeting Notices for IAS and PES



Basics of Load Flow Analysis

Thomas J. Dionise, P.E.

Senior Power Systems Engineer
Eaton Electrical

The load flow study is one of the common tools used in power system analysis. Analysis of the steady-state performance of a power system benefits planning, design and operation. In this talk, the basics of load flow analysis will be presented. The topics will include an overview of the types of load flow studies, discussion of data requirements, brief review of common solution methods and analysis techniques. Practical examples from industrial, commercial and utility power systems will be used to illustrate the concepts. After the presentation, there will be an opportunity to work an example case study on the computer.

Place: Eaton Electrical, Warrendale
Date: March 4th
Social: 6:30 PM
Program: 7:00 PM

Power Protection and Conditioning

Alan Chiste

Product Manager
Eaton Electrical

The Quality Industry is rapidly changing due to the demand for increased reliability, the heightened sensitivity of loads, and new Power Quality products and solutions. This talk will provide an update on these issues, as well as new surge protection and power conditioning products available. Topics will include designing a facility-wide protection plan, effective power quality solutions, and new technologies. A mix of theory and applications will be discussed.

Place: Eaton Electrical, Pittsburgh
Date: March 23rd
Dinner: 6:00 PM
Program: 7:00 PM

Detailed information for these seminars, along with directions to the meeting location will be in the March Bulletin. Mark your calendar now, and look for the details next month.

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Leadership Skills for Engineers in the Workplace

Charles P. Rubenstein, Ph.D.

Overview: The IEEE Pittsburgh Section PACE committee is presenting a workshop on leadership skills for engineers. There will be one section of the workshop as a single all-day session.

Who Should Attend: This course is intended to help engineers and engineering managers achieve advancements for themselves, and successes for the companies they work for.

Key Benefits: This workshop will help participants recognize and develop interpersonal, group, team and individual leadership skills. The format is through interactive participation, also using exercises and case studies. The skills developed are appropriate for application in management or leadership positions in various types of organizations, including business, industry and volunteer activities.

Content: The course will address such issues as: What are the attributes of a leader? What does a leader do? What motivates people? What motivates volunteers? What is the relationship between management and leadership? Holistic communications and active listening. Keys to leadership problem identification and solution techniques. Identification of personal interactive skills (Jungian types). Identifying conflict styles and managing conflict. Brainstorming for building teams and consensus. Coaching and persuasion. Basic presentation skills.

Instructor: Charles Rubenstein is a tenured professor of Engineering and Information Science at the Pratt Institute graduate School of Information and Library Science. He has an earned doctorate in Bioengineering from the Polytechnic Institute of New York and master's degree in Library and Information Science from Pratt Institute.

Dr. Rubenstein is a senior member of the IEEE. He has been a member of the IEEE-USA PACE Committees since 1999, currently serving as Vice-Chair, and a member of the Engineering Management Society Board of Governors since 1988, currently serving his fourth term as Vice President, Member Relations. Dr. Rubenstein has been an Engineering Management Society Distinguished Visitor since 1997.

Place: To Be Determined

Date: April 17th

Program: 8:00 AM to 4:00 PM (Lunch served)

Registration Fees

	By March 17 th	After March 17 th
Member	\$50	\$75
Non-Member	\$75	\$125

Seminar Coordinator: Harry Hagerty is the Past Chairman of the IEEE Pittsburgh Section. For more information, please contact Harry at (412) 492-0943 x226 or hhagerty@ieee.org. Reserve your spot now. Space is limited to 25. Deadline for registration is April 1st. This program is hosted by the IEEE Pittsburgh Section, and PACE.

Current & Voltage Measurements in High Voltage Systems Using Pure Optical Sensing Techniques

Aftab Khan, ABB High Voltage Components

Traditional stand-alone current and voltage measurement devices in high voltage transmission system (69 kV and above) utilize wound iron-cores or capacitive dividers to scale-down current and voltage levels for measurement. New current and voltage measurement devices utilizing pure optical sensing techniques offer the following advantages over these traditional devices: simple high voltage insulation, lighter weight, flexible installation options, accuracy over a wide primary current range, and optical isolation to measuring devices. This presentation will discuss the physical effect, which allows light to be used for current and voltage measurement, the design features of an optical current and voltage measurement device, and the advantages of this technology over traditional measurement devices.

Date: March 17th

Registration Form

Leadership Skills Workshop, April, 2004

Make checks payable to "IEEE Pittsburgh Section". Submit check and registration form to Harry Hagerty, 1659 E Sutter Road, Glenshaw Pa 15116

Mr./Mrs./Ms. _____

All-day session Apr 17: _____

Home Address: _____

City and Zip: _____

Phone: _____ E-mail: _____

Member #: _____ Grade: _____

Amount enclosed: \$ _____

EMC, What is it?

Harry Godlewski

With the advance of technology, electrical and electronic systems designs have become progressively more complex. This advancing complexity of design has led to intra-system and inter-system interactions not anticipated by the original designers. Some of these interactions have led to new system concepts. However, the majority of these interactions have resulted in system disoperation and failure. The resolution of these undesirable interactions led to the birth and growth of a new specialty within the electrical engineering discipline and systems design. Today that sub-discipline is known as Electromagnetic Compatibility (EMC) engineering.

The talk will provide an over view of EMC engineering. The origins and history of the discipline will be reviewed. Types of EM interactions will be discussed. Methods of addressing EMC will also be presented. Some working examples and anecdotes will be explored.

Date: April 1st



Outsourcing Summit

Outsourcing is a term we've heard a lot about lately in the engineering and computer science professions. Once believed to be primarily for call centers and help desks, outsourcing - particularly offshore outsourcing - is now raising serious implications for your personal career and U.S. technical leadership in a global economy.

Domestic and offshore outsourcing of everything from business critical processes to non-core functions is affecting today's economic climate with results that impact all industries, business leaders and outsourcing providers as well as our local workforce. In response, the Pittsburgh Technology Council, with the IEEE Pittsburgh Section, will present a daylong Summit to review the latest developments in outsourcing, analyze best practices and discuss perspectives on outsourcing issues. Join us to help determine how the issue of outsourcing is shaping business today and what role it will play in your career and the region's and nation's future.

Place: Pittsburgh Convention Center
Date: March 10th

For additional details contact John Twigg at (724) 387-2772 or jtigg@ascent-systems.com.



Robot Car Race

The IEEE Pittsburgh Section is sponsoring the IndEEE 500 cm Robot Car Race at the Carnegie Science Center on February 21st. Eighth grade students from local schools use Lego MindStorm kits to build and program their cars. The cars must be programmed to follow an S-shaped curved track. Volunteers are needed to help students work through construction and programming. Volunteers can be trained the day of the race. The volunteers would need to be available for all or part of the race time. Construction begins around 12:00 noon and the race is usually over by 4:30 PM. Laptop computers are also needed. If you are able to help out, please contact Gerry Kumnic at (412) 487-1430 or gerrykum@ieee.org.

Engineers Week

In addition to the robot car race, IEEE will also be hosting a table at the Carnegie Science Center. The table will have several small "experiments" that visitors can wire. A doorbell system will be available where visitors can easily wire the system to make the doorbell operate when the switch is pushed. Volunteers will explain the concept and basic principles of completing the circuit to make it operate properly. Volunteers are needed from 10:00 AM until 5:00 PM for 1-hour shifts. Volunteers will receive an E-Week T Shirt, free admission to the science center, free parking and a discount coupon for your family if they would like to visit the science center.

For more information, or to schedule your 1-hour time slot, please contact Tom Dionise at ThomasJDionise@eaton.com.

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