



IEEE Pittsburgh Section



# Bulletin

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*All announcements for publication in a particular month's bulletin are due to the Editor by the 20th of the previous month. The accuracy of the published material is not guaranteed. If there is any error, please bring it to the Editor's attention. The Section's web site [www.ewh.ieee.org/r2/pittsburgh](http://www.ewh.ieee.org/r2/pittsburgh) has past issues of the bulletin and lots of other useful information*

## • *From the Chair*

### Section Chair Comments

Greetings, friends. I trust you are all doing well.

The Pittsburgh Section will be relaxing a bit over the summer, as we typically do. There will still be some programs and meetings over the summer, but not so many. Knowing that our members take vacations and travel in the summer and that everyone needs a break from time to time, we scale back our activities. We will resume the full schedule in September. The Section Picnic in September would be a great opportunity to get involved and meet the other Section members.

The 2008 Sections Congress is in Quebec Canada. This event occurs every three years and is a gathering of international section leadership. The Region 2 meeting will also take place at the Sections Congress. The executive committee voted to send myself and John Twigg. Please let us know if you have concerns or issues you would like us to bring up at these meetings.

As always, I welcome comments, concerns, or feedback. Please let me know what is on your mind.

Ralph Sprang  
Pittsburgh Section Chair  
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### Section

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Immediate Past Chair – David J. Vaglia, P.E.  
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UpperMon Subsection  
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### Chapters

Communications Society - Chair: Phil Cox  
[p.e.cox@ieee.org](mailto:p.e.cox@ieee.org) (724) 443-0566

Computer Society – Chair: John Twigg (see above)

Engineering In Medicine & Biology Society  
Co-Chairs: Bob Brooks (see above), Dr. Zhi-Hong Mao  
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Electromagnetic Compatibility Society  
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Power Engineering & Industry Applications Societies  
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Magnetics Society – Chair: Dr. Ganping Ju  
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Robotics Society – Chair: Dr. Guy Nicoletti  
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Signal Processing Society – Chair: Dr. Heung-No Lee  
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Society on Social Implications of Technology  
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Co-Chair: Andrew Rydholm, [andrew\\_rydholm@yahoo.com](mailto:andrew_rydholm@yahoo.com)  
(412) 261-3200 x281

### Affinity Groups

GOLD – Chair: Jason Harchick, [jharchick@ieee.org](mailto:jharchick@ieee.org)

Life Member – Chair: Bob Grimes, P.E.  
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Women In Engineering – Chair: Jennifer Ploskina  
[jenniferLploskina@eaton.com](mailto:jenniferLploskina@eaton.com)

### Committees

Consultants Network

Professional/Career Activities (PACE)  
Chair: Joe Kalasky, P.E. (see above)


Student Activities – Rajiv Garg, [rajivg@computer.org](mailto:rajivg@computer.org)

Membership Development – Karl Muller,  
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Publicity – Chair: Thomas Dionise, P.E.  
[ThomasJDionise@eaton.com](mailto:ThomasJDionise@eaton.com) (724) 779-5864

2008 PES General Meeting Technical Program Chair – Dr. Kalyan Sen (Kal) [senkk@ieee.org](mailto:senkk@ieee.org) (724) 696-1611; General Chair - Dave Vaglia (see above)

- ***Controlling Speech Quality in VoIP Networks***

**Speaker:** Dr. Richard A. Thompson, Professor of Telecommunications at the University of Pittsburgh  
**Date:** Thursday, May 8, 2008  
**Time:** Lecture 6:00 PM  
**Place:** School of Information Science Building, First Floor Conference Room, 135. North Bellefield Avenue, University of Pittsburgh  
**Sponsor:** 

**Abstract:** Of the numerous technical factors that impair the quality of telephonic speech, this talk describes how digitizing speech solves some problems while adding others, and how packetizing the bits adds still more problems but could potentially solve some. After describing how end-to-end delay affects echo and cognitive interaction, delay in VoIP networks is shown to be a complicated function of packet-size, and packet-size is shown to be dynamically optimizable for different network congestions.

Then, after describing the acoustic limitations of so-called "toll-grade" telephony (and listening to some speech clips), this talk describes how to extend the classic speech quality metrics to include acoustic fidelity. Finally, techniques are proposed for dynamically controlling, not just delay, but total speech quality, as a function of network congestion.



**About the Speaker:** Dr. Richard A. Thompson has been a Professor of Telecommunications at the University of Pittsburgh since 1989, after 20 years at AT&T's Bell Laboratories. He was the Chair of Pitt's Telecom Program for 16 years, has a secondary appointment in Pitt's EE Department, and is affiliated with Pitt's undergraduate Photonics Program. His BS and MS degrees, each in EE, are from Lafayette College and Columbia, respectively. His PhD, in Computer Science, is from the University of Connecticut. Besides peripheral research interests in human-computer interaction and probabilistic automata (with application in statistical packet dependence), Dr. Thompson's principal research area is communications switching, especially photonic switching and Voice over IP. Dr. Thompson is a former chair of the IEEE Comsoc Technical Committee on Switching and Routing. He has over 90 research publications, including two textbooks, Telephone Switching Systems and The Physical layer of Communications Systems. He is a founding board member of the International Telecommunications Education and Research Association and received ITERA's Research Career Award in 2007.

- ***Tour Of The Eaton Power Quality Experience Center And Lab***

**Presenters:** Eaton  
**Date:** Thursday, May 8, 2008  
**Time:** Social 5:30 PM, Program 6:00 PM  
**Place:** Eaton, Warrendale, PA (directions below)  
**RSVP:** Charles Baker, P.E. [bakercf@westinghouse.com](mailto:bakercf@westinghouse.com) or 412-374-5425 by May 5, 2008

**Organizers:** Power Engineering Society/Industrial Applications Society

**Abstract:** The Eaton Power Quality Experience Center and Lab is a full-scale demonstration and test facility that showcases power system conditions and scenarios and the solutions to power problems. The facility can demonstrate firsthand the technical and financial challenges associated with applying power quality solutions on commercial, institutional and industrial power systems. The lab has the capability to simulate power quality problems, including energy efficiency, harmonic issues, voltage disturbances such as overvoltage, sags, and surges and other power quality disruptions. The lab has recently been updated to expand the labs capabilities.

**DIRECTIONS TO EATON IN WARRENDALE:**

From Pennsylvania Turnpike:

Take the PA Turnpike (I-76) to Exit #28. Follow the signs for Route 19 South. Follow Route 19 South to 2nd traffic light. Turn right into the Thornhill Industrial Park. At the light turn right onto Commonwealth Drive. Eaton/Cutler-Hammer is the third building on the left.

From Pittsburgh via I-279 and I-79 North:

Take I-279 North to I-79 North. Continue on I-79 North to the Warrendale Exit (#75). At the stop sign, turn left, go under I-79, then turn right onto Brush Creek Road (first street on the right). Follow Brush Creek Road approximately 1.5 miles to the 3rd traffic light. Brush Creek turns into Commonwealth Drive at this point. Proceed straight ahead onto Commonwealth Drive. Eaton/Cutler-Hammer is the third building on the left.

- ***EMC - Equipment Test Guidelines, Test Setups, Work Scopes, and Reporting for Qualifying Equipment to MIL-STD-461***

**DATE:** Wednesday May 21st, 2008

**TIME:** 6:00 pm—roast beef / turkey croissants and desert; 7:00 -8:30 pm—seminar

**LOCATION:** Westinghouse Energy Center, Monroeville, PA West Auditorium **SPEAKER:** Mr. Bowman, Senior Systems Engineer for Missiles and Fire Control Department of Lockheed Martin Corporation

**COST:** No Charge - but RSVP Required to Michael J. Oliver, emi@majr.com or 814-573-2812 by Wednesday May 16, 2008

**SPONSOR:** IEEE EMC Society, Pittsburgh Chapter

**ORGANIZER:** Michael J. Oliver, emi@majr.com or 814-573-2812

**Abstract:** Inadequate or incorrect test setups for qualifying equipment to MIL-STD-461 can cause cost overruns and schedule delays during first article testing. Poor generation of work scopes and reporting of the findings can introduce doubt on the acceptability of the product's performance. This seminar will focus on the interpretation of the guidelines and requirements specified in MIL-STD-461 setups and provide some considerations when designing the support and monitoring equipment of the product being qualified. Aspects of the test setups, including input power source selection and connection, support stimulus equipment and cabling, and monitoring techniques, will be discussed. Generation of the work scope and test report, and approaches to presenting failures and their

resolutions will be discussed. The consequences of insufficient attention to these details are not only financially costly to a specific program but also can damage a company's reputation.

**Biography:** Mr. Bowman began his career in the commercial nuclear power industry as a design engineer. He then held positions of increasing responsibility as a test engineer and is presently a Senior Systems Test and Integration Engineer with Lockheed Martin Missiles and Fire Control. In this role, Mr. Bowman has more than 26 years of experience in designing and performing qualification testing of safety-related instrumentation and control systems for the US Navy. He has qualified almost all of the current Rod Control Systems and many of the Protection and Nuclear Measurement Instrument systems. He has also directed E3 qualification efforts, including HERO testing, on precision guided weapons per MIL-STD-461 and MIL-STD-464. He is responsible for the coordination of all program test activities and assists in the resolution of test findings. Mr. Bowman is often called upon as a consultant by other Lockheed Martin divisions.

- ***Expanded Tutorial Offering***

**What:** Technical Tutorials Covering a Variety of Power Engineering Topics  
**Why:** A Special Offer in Conjunction with the 2008 PES General Meeting  
**Who:** For IEEE Pittsburgh Section Members Only  
**Where:** Pittsburgh, PA at the David Lawrence Convention Center  
**When:** July 20-24, 2008

The IEEE PES is holding their General Meeting here in Pittsburgh this summer and eight technical tutorials are being presented. All of them offer the opportunity to earn PDH credits, which will be issued through IEEE headquarters. The course titles, CEU's, dates, sponsors, and brief summaries are shown below. Detailed descriptions can be found at the meeting website noted below. Registration for the General Meeting is NOT required for IEEE Pittsburgh Section members to attend one or more tutorials.

If you plan to register for and attend the General Meeting and will attend a tutorial, please utilize the PES meeting website to register on-line for tutorials and DO NOT use the registration form referenced below. You can register for the conference and tutorials at the same time at <http://ewh.ieee.org/cmte/PESGM08/>.

If you DO NOT plan to attend the General Meeting but are interested in taking one or more of the tutorials, please fill out the registration form and send it to the address indicated with a check payable to: "IEEE Pittsburgh Section". Prices are listed on the registration form.

Click here to see detailed course descriptions and registration form:  
[http://ewh.ieee.org/r2/pittsburgh/Extended\\_Tutorial\\_PES\\_GM\\_Article.pdf](http://ewh.ieee.org/r2/pittsburgh/Extended_Tutorial_PES_GM_Article.pdf)

**Contact:** Bob Slobodnik with any questions on these tutorials at: [rslebod@alleghenypower.com](mailto:rslebod@alleghenypower.com)

## • *Nuclear Energy Now*

Speaker: Dr Michael Mallery, IEEE Fellow  
Date: Thursday, May 22, 2008  
Time: Social 6:30 PM, Program 7:00 PM  
Place: Westinghouse Energy Center  
Cost: No Charge but RSVP Required by Wednesday May 15, 2008  
Sponsors: Power Engineering Society/Industrial Applications Society.  
Organizer: Dr. Kal Sen, P.E., [senkk@ieee.org](mailto:senkk@ieee.org) or 724-696-1611.

The stability of our climate is seriously threatened by the growth of carbon dioxide emissions that are projected for this century in any business-as-usual scenario. The scientists on the Inter-Governmental Panel on Climate Change have recently released a consensus report that assigns 95% confidence to the conclusions that significant climate change has already happened and that human activities are responsible for most of it. NASA's well respected and chronically censored climatologist, Dr James Hansen, has warned of passing "tipping points" if reductions in carbon dioxide emission are not achieved in the next decade. Though significant mitigations can be achieved with conservation and renewable energy sources, it is argued that these cannot provide the "base line" power that is necessary in order to phase out fossil fuel electric power generation. Only nuclear energy can fill this need for off-the-shelf carbon-free electricity. The hazards, costs, and concerns that are identified by opponents of nuclear energy will be discussed and shown to be more tractable than the climatic disaster that looms over our children.

*About the speaker:* Dr Michael Mallery received a bachelor's degree in physics from MIT in 1966 and a PhD in Experimental High Energy Physics in 1972 from the California Institute of Technology. He has co-authored 17 papers in this field. His thesis work was on CP Symmetry Violation. He did post doctoral work at the Rutherford Laboratory. He then taught physics at Northeastern University as an Associate Professor. As part of the High Energy Physics team there, he worked on experiment #439 at Fermi Laboratory which reported early evidence for the existence of the fifth quark. The interplay of CP Violation and the number of quark to produce the matter of our reality will be discussed in this talk.

In 1978 he worked on the design of superconducting and conventional magnets for industrial and research application at the Magnetic Corporation of America. He joined the Digital Equipment Corporation's effort to design thin film magnetic recording heads in 1980. Since then he has received 60 patents in magnetic recording and authored and co-authored 30 publications in the field. His work has made numerous significant contributions to the growth of magnetic recording density by a factor of 10,000 over the last 25 years. Notable among these are the Shielded Pole perpendicular write head; the Diamond high turns inductive head; and the use of a low ratio of bit density to track density for maximizing recording density. In 2004 he published *Our Improbable Universe*, Thunder's Mouth Press, 2004, ISBN 1-56858-301-X. Also see [ImprobableUniverse.com](http://ImprobableUniverse.com). This work traces the evolution of individual and collective mind out of the primordial energy of the Big Bang.

Presently he is a Research Staff Member Senior Member at the Seagate Research Center in Pittsburgh working on advance recording technologies.

## DIRECTIONS TO WESTINGHOUSE ENERGY CENTER

From Pittsburgh take Interstate 376 East (Parkway East). Take Exit 14A to Monroeville. Cross Business Rt 22 at the traffic light and proceed on Rt 48 South (Moss Side Blvd) approx ½ mile (two traffic lights). The 2<sup>nd</sup> traffic light is at a 4-way intersection with an Exxon station on the right. Turn left onto Northern Pike. Proceed approx 0.2 miles and turn right at the 1<sup>st</sup> traffic light onto Westinghouse Dr. Travel 0.7 miles (past the guard stand) to the 3 flags where the building's main entrance is located. Parking in the evening will be plentiful. Use the main entrance and check with the security guards inside. You will be directed to the proper room for your meeting.

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

### • *Power Quality Tutorial*

- Speakers:** Dan Carnovale, Manager Power Quality Solutions, Eaton Corp;  
Tom Dionise, Senior Power Systems Engineer, Eaton Corp.
- Date:** Saturday, June 7, 2008
- Time:** Registration – 7:30 AM with coffee and donuts,
- Tutorial:** 8:00 AM to 4:00 PM, Lunch from 12:00 to 1:00
- Place:** Eaton Corp., 130 Commonwealth Dr., Warrendale, PA
- Cost:** IEEE Members \$50.00  
Non-Members \$75.00  
Students \$25.00
- Sponsors:** Power Engineering Society/Industry Applications Society
- RSVP:** **Required by May 29, 2008. Registration limited to 24 people.**

For more information, contact Andy Novotny at [andrewnovotny@ieee.org](mailto:andrewnovotny@ieee.org) or 412-963-5510. Please make registration checks payable to IEEE Pittsburgh Section and mail to Andrew Novotny, 514 Price Avenue, North Braddock, PA 15104.

**Abstract:** This Tutorial will be held at the 6,000 sq. ft. Eaton Power Quality Experience Center and Laboratory where a full scale power system will be used to demonstrate and test common power quality problems and solutions. Students will be given theory and a chance to see the theory used in real applications demonstrating the effects of power surges, interruptions, sags, harmonics and power factor on real systems. The types of power



systems present include: Commercial Power, Industrial Power, Data Center Power and Residential Power. A mix of short classroom presentations combined with several actual demonstrations in Eaton's Power Quality Experience Center and Lab will give the students a better understanding of the power quality issues and their available solutions.

**Directions to Eaton:** From downtown Pittsburgh take I-279 North for 13 miles and merge into I-79 North. After 4 miles, Exit I-79 North at Exit 75, Warrendale. At the traffic light at the end of the exit ramp, turn left onto Warrendale-Bayne Rd. Turn right at the Park N Ride onto Brush Creek Rd. At the second traffic light at the intersection with Thorn Hill Rd, Brush Creek Rd becomes Commonwealth Dr. Continue on Commonwealth for about 0.1 mile, and then turn left into 130 Commonwealth Dr.

- ***IEEE Launches MemberNet Online Directory***

The IEEE has launched an online member directory designed to encourage peer-to-peer networking within IEEE membership. memberNet is the first step in a series of next-generation capabilities that will encourage virtual collaborations between members with similar technical interests, regardless of geography. While the basic member profile in memberNet contains every member's name and membership grade, each member can indicate by check mark what additional information they would like to also have appear. These may include technical interests, local Section, or IEEE Society affiliation. The memberNet directory, and its opt-in management, is accessible from myIEEE, at <http://www.ieee.org/myieee>. For more information about IEEE memberNet, visit <http://www.ieee.org/membernet>.

- ***2008 PES Chapter Outstanding Engineer Award Announcement***

**Harry D. Hagerty receives the 2008**

**PES Chapter Outstanding Engineer Award**



Harry began his career as an electrical engineer with Westinghouse Electric Corporation at its Power Circuit Breaker Division in Trafford, Pennsylvania. Prior to joining Benschaw in 1990, Harry held positions of increasing technical management responsibility in a number of different companies, including Robicon Corporation, Pittsburgh, Pennsylvania, Randtronics Transit Division, Menlo Park, California and Philadelphia, Pennsylvania, and Leybold Vacuum Pumps in Export, Pennsylvania.

In 1990, Harry joined Benschaw, Inc. as Director of Engineering and in 2005 he was named Vice President and General Manager of Benschaw's Industrial Controls Division. In 2006, Harry was appointed to the position of Vice President and General Manager of Benschaw's Medium Voltage Division & Research and Development, where he led all strategic product development, including eighteen-pulse variable frequency drive devices, low and medium voltage (up to 15 kV and at power levels to 20,000 hp) Silicon Controlled Rectifiers, power controllers, and all aspects of power electronics design,

simulation and systems analysis. Recently, he has been promoted to the position of General Manager, Benshaw, Inc., Glenshaw, PA. Harry has extensive technical and leadership experience with all aspects of Benshaw's business.

Harry is a registered Professional Engineer in the state of Pennsylvania and earned his B.S. in Electrical Engineering from the University of Pittsburgh in 1973.

#### **Achievements during the years 2006 and 2007**

- **Patents** - US Patent 7,345,449 B2 issued 3/18/2008 - Method of rotating a polyphase motor at less than rated speed
- **Publications** - IEEE PCIC -2002 - Switched capacitors control feeder regulation with thyristor starter
- **Presentations** - Solid State starters theory of operation and advanced simulation and SCR controls tutorial – Houston seminars 2003 through 2007

Case study 22,000 HP 13,800 Vac solid state starter design – Houston May 2007

Medium voltage solid state starters theory of operation and applications, New Orleans June 2007

Harry has volunteered to present a tutorial on Solid-State Motor Starters at the 2008 PES General Meeting in Pittsburgh.

- **IEEE member/officer/volunteer** - Harry Hagerty, a Senior Member of IEEE and a member of the IAS/PES, has served the organization in many positions. During 2003, when Harry was the IEEE Pittsburgh Section Chair, he was very much supportive in resurrecting the local PES and IAS chapters that were dormant for over five years. Since its rebirth, Harry has served the AdCom. He has been an active member of the Pittsburgh Section ExCom. During the last two years, he has served the IEEE Pittsburgh Section as the Treasurer.

#### **• *New Senior Members***

Congratulations to the following members of the Pittsburgh Section who were promoted to Senior Members of IEEE in February 2008:

Dongxing Jin

Jennifer Ploskina

Michael Seigler

Metin Sitti

Daniel Sullivan

Jie Yang

- ***Career Survival for Engineers and Scientists in the 21st Century***

The Power Engineering Society and Industry Applications Society of the IEEE Pittsburgh Section is planning to have a 1-day career management seminar developed by the IEEE-USA Career & Workforce Policy Committee in cooperation with the IEEE-USA Employment and Career Services Committee on July 19, 2008, the Saturday before the PES General Meeting in Pittsburgh.

The goal of this seminar is to show you how to prepare yourself to manage or run your career in this era of globalization and selective hiring. Some topics to be discussed by the speakers include:

- Changes in the job market
- Requirements of the job market and how you relate to the market
- Adapting to new workplace
- Knowing personal weaknesses and strengths
- Starting a personal career plan, values statement and branding
- New methods of job searching
- Understanding the interview process
- How to use IEEE resources to help yourself to try new innovative job searches

If you are interested in enhancing your career by empowering yourself to work with management and human resources to innovate your own career in the 21<sup>st</sup> century, this is for you. The first step is to let us know if you have an interest in attending a seminar of this caliber. There will be a nominal fee for this seminar. Lunch will be provided. We need your response to have a count to have the proper venue. Please e-mail Andrew Novotny at [andrewnovotny@ieee.org](mailto:andrewnovotny@ieee.org) to reserve your place for this important seminar.

- ***Raise Your Company's Profile***

Show your supervisor that you are not just an excellent engineer, but you have business acumen as well. Point out the excellent opportunity to advertise your company when the Power Engineering Society's General Meeting is held in Pittsburgh for five days in July, 2008. Over 1800 electric power professionals from around the world are expected to attend. The group will include manufacturers, consultants, electric utility employees, and more. Your company could provide pens or post-its with your logo for each participant, support a bus taking participants to a technical tour, advertise on-line at the General Meeting web site, or do all three and more. Prices start at \$750. To learn the details, go to <http://ewh.ieee.org/cmte/PESGM08> and click on *Raise Your Company's Profile* in the left column. There you'll find a complete letter that you can give to your supervisor or your company's marketing department. It details all the various opportunities available for supporting the General Meeting while advertising your company.

Your company's advertising also has the potential to benefit the IEEE Pittsburgh Section. The Pittsburgh Chapter of PES/IAS will receive up to \$7500 if the General Meeting's income exceeds its expenses by a sufficient amount. So do it for you and for your company and for IEEE Pittsburgh. If you have questions, email Jace Cochrane at [jacejc@pghmail.com](mailto:jacejc@pghmail.com).

- ***Neural Networks - Part I***

## **Introduction**

A neural network is a computing system which consists of a number of simple, highly interconnected processing elements which process information by determining the value of an output signal based on the values of several input signals. After knowledge has been learned, it is stored in the way the neurons are connected and in the way the individual neurons adjust their weights as the network learns.

Unlike expert systems, neural networks do not require the user to specify a number of “if-then” rules. The network only requires specific examples of input values along with the corresponding output values. One essentially teaches the network how to respond to a set of specific examples. The network determines the rules that work for the specific examples. Click the link below to see full article:

[http://ewh.ieee.org/r2/pittsburgh/Neural\\_Networks\\_2.pdf](http://ewh.ieee.org/r2/pittsburgh/Neural_Networks_2.pdf)

- ***Local Job Opportunity - Principal Electrical Engineer***

**ORGANIZATION:** Metso Minerals BMH

**LOCATION:** 1500 Corporate Drive, Suite 300, Canonsburg, Pennsylvania 15317

**QUALIFICATIONS:** Bachelor of Science Degree in Electrical Engineering or equivalent. Minimum of ten (10) years of experience preferably in the design of bulk material handling equipment. Professional Engineer license is required. The position requires an in depth knowledge of all aspects of bulk material handling equipment inclusive of the structural, mechanical, electrical, and hydraulic facets. The Principal Engineer must understand shop manufacturing and field erection procedures in addition to possessing knowledge of operation and maintenance procedures. Technical sales experience is desirable as is project management skills. Must be able to undertake moderate (33%) potentially international travel, carry up to 40 pounds, and climb stairs/ ladders.

This is not a Project Engineer position but more a “hands on” senior technical role. Familiarity with PLC’s, drives, and controls are critical elements of the position.

**SUMMARY OF DUTIES:**

1. Performs various design, proposal, and troubleshooting activities on bulk material handling equipment.
2. Preparation of the necessary technical data to design, modify, or retrofit heavy bulk material handling equipment.
3. Reviews contract requirements, selects appropriate equipment designs, prepares all calculations and specifications, and reviews design drawings.
4. Frequently interacts with customers and suppliers in equipment definition and troubleshooting.
5. Supervises the equipment field installation.
6. Troubleshoots customer problems and recommends solutions.
7. Prepares cost estimates and proposals and assists in overall sales.
8. Inspects equipment in the field, prepares, and presents recommendations.
9. Makes sales calls as necessary.

**SALARY RANGE:** Commensurate with experience.

**HOW TO APPLY:** Resumes may be submitted to the Metso site at:  
[hrmetsoBMH@metso.com](mailto:hrmetsoBMH@metso.com)

## 2008 Calendar – Meetings of IEEE Pittsburgh Section

	Jan	Feb	Mar	Apr	May	June	July	August	Sept	Oct	Nov	Dec
Executive Committee	17 - 7pm Panera Bread Oakland	21 - 7pm Panera Bread Oakland	28 – 5:30pm UP Greensburg	17 - 7pm Panera Bread Oakland	15 - 7pm Panera Bread Oakland							
Section		16 Engineers Week table		24 History Dinner								
Communi- cations		1 Contention Resolution			8 VoIP							
Computer		16 Robot car race										
EMBS			20 <i>Neural Engineering</i>	3 - Sensor- motor 17 – Bio- mechanics								
EMCS					21 Test Guide							
PES/IAS	16 - AdCom 6:00 PM 23 - Why not nuclear	20 - AdCom 6:00 PM Panera Bread Penn Center 27 - Electric Vehicle	12 Thermal Systems 26 Universe	2 Obtaining PE License 9 July 2008 PESGM LOC mtg	7 - July 2008 PESGM LOC mtg 8 - Eaton Tour; 22 - Nuclear	7 Tutorial 12- July 2008 PESGM LOC mtg	9-loc. mtg 20-24 - PESGM 19 Career Survival					
Magnetics			5 Nanomagnetic bits	10 - Radiation pressure 24 - Spintronic								
Robotics												
Signal Processing												
Social Impl of Technlgy			28 Utility Meter									
Upper Mon	28 Biomolecul ar Detection Device	4 Radio Astronomy										
Women in Engineering	10 Inaugural Meeting											
Life Member												
GOLD												
PACE												
Student Act												