

RockIEEE Overlook

March 1991

Newsletter of



**The Institute of Electrical and Electronics Engineers
Denver Section**

Chairman's Message

by Gary Petersen

$2 \times 4 = 7$ (or is it 9) ? ?

We continue to be faced with examples of weakening math and science skills among our pre-college students. Enrollment in engineering schools has been down and there is evidence that the U.S. is losing its position of technical leadership.

Interested volunteers from within the ranks of technical professionals are needed to take responsibility for America's future competitive success. At the national level, IEEE has a number of pre-college math and science education programs available. Locally, Dan Michaels is the Denver Section Pre-College Activities Chairman. Tutoring, career day participation, student competitions and technical resource programs are examples of contributions you can make.

The Denver Section has a wealth of technical expertise available, and together we can make a difference. The time required would depend solely on your own availability. If you would like to be involved, please call Dan (939-5139) or me (329-1506) to discuss how you can help.

THANK-YOU to John Tierney at Public Service Company of Colorado for his effort in working with the Denver Section membership database.

Society Chapter Meetings and Information

Reliability Society Joint ASA/IEEE Reliability Society Meeting

Tuesday, March 5, 1991

National Jewish Hospital
1400 Jackson St.
Denver, Colorado

5:00 p.m. - Registration
5:15 p.m. - Presentation
6:15 p.m. - Reception
7:00 p.m. - Dinner

Speaker

Dr. Wayne Nelson
Consultant

General Electric Corp. Research and Development

"Graphical Analysis of Failure Data for Repairable Systems"

The Denver Section of the IEEE Reliability Society in cooperation with the local section of the American Statistical Association are delighted to host a presentation by Dr. Wayne Nelson. A reception and dinner follow Dr. Nelson's presentation.

An employee of General Electric Corporation's Research and Development (GECRD) organization for 23 years, Dr. Nelson is now a private consultant to GECRD. He is a leading expert on reliability data analysis and statistical methods for accelerated testing. Dr. Nelson is also an Adjunct Professor at Union College where he teaches graduate courses on the theory and application of statistics. His honors include his 1990 election as an IEEE Fellow in recognition of his contributions to reliability, accelerated test analysis and reliability education.

Dr. Nelson has authored over 90 publications on statistical methods for engineering applications. He is the author of several books, including 'Applied Life Data Analysis' (Wiley, 1982) and 'Accelerated Testing: Statistical Models, Test Plans, and Data Analysis' (Wiley, 1989).

The menu for dinner will include a selection of fish, chicken or beef entrees. Total cost for dinner including tax and gratuity will range from \$12.00 to \$15.00 depending on the entree.

Those IEEE members planning to attend are asked to R.S.V.P. to Rick Karcich no later than 5:00 p.m. on Tuesday, February 23, 1991. Rick's number is (303) 673-6223

Front Range Software Quality Committee

Friday, March 15, 1991

Guaranty National, Englewood, Colorado
2:00 - 4:00 p.m.

Speakers

Jim Jost
Hewlett-Packard
Colorado Springs, Colorado

"Software Reuse: Metrics & Measurement"

The Logic Systems Division (LSD) of the Hewlett-Packard company has attained very high levels of reuse in their product line. Many products have over 70% reuse. This talk will present a history of reuse at H-P's LSD and explore some of the reasons why it has been successful. A number of process problems caused by reuse will also be explored.

Please call Rick Karcich, 673-6223 for information.

EMB

Engineering in Medicine and Biology

Wednesday, March 20, 1991

Swedish Hospital
601 East Hampden
Conference Center, Second Floor, Pine Room C
7:00 p.m.

Speakers

Robert Mischke, M.D., Denver Ear Associates
Jon Shallop, Ph.D., Denver Ear Institute
James Heller, MSEE, Cochlear Corp., Englewood

"Cochlear Implants, A Current Perspective"

A presentation of the basic principles and current technology for restoring hearing by electrical stimulation of the inner ear.

Free parking is available in the garage across the street from the hospital.

Dinner is available prior to the meeting in the hospital cafeteria adjacent to the conference room.

Reservations are recommended.
Please call Jim Heller at 790-9010.

Magnetics Society

Thursday, March 14, 1991

Storage Technology Corporation
Louisville, Colorado
6:00 - 7:00 p.m.

Speaker

Frank S. Barnes
Department of Electrical and Computer Engineering
University of Colorado, Boulder

"The Effects of Time Varying Magnetic Fields on Biological Materials: Are Power Lines Dangerous?"

In this talk we briefly review the mechanism by which AC magnetic fields interact with biological materials. After covering some of the basic types of interactions, selected data from some of the most frequently cited experiments on the biological effects of these fields at low frequencies are presented along with their possible relevance as health hazards.

Please call Dr. Subrata Dey, 673-6494 for meeting location and for further information.

Power Electronics Chapter

Thursday, March 21, 1991

Please call Clyde Manning, 682-6492, for the room number and other information.

Thank You

IEEE Denver Section would like to sincerely thank the advertisers whose ads have been published in the RockIEEE Overlook.

We appreciate your participation!

Joint AP/MTT/GRS Antennas and Propagation, Microwave Theory and Techniques, Geoscience and Remote Sensing

*** Notice: AP/MTT/GRS February meeting
has been cancelled. ***

Thursday, March 21, 1991

National Institute of Standards and Technology
325 Broadway, Boulder, Room 1103
4:00 - 5:00 p.m.

Speaker

Nicholas G. Paulter
Broadband Microwave Metrology Group
National Institute of Standards and Technology
Boulder, Colorado

"Characterization of Planar Circuits Using Pulsed Lasers and Ultrafast Sampling Techniques"

This talk will discuss the use of ultrashort pulsed lasers and ultrafast electro-optic and photoconductive effects to characterize electrical circuits. The results of a study of picosecond electrical pulse propagation on coplanar waveguide transmission lines will also be presented.

No reservations are required. Please call Katie MacReynolds at 497-3471 for information.

Joint PES/IAS Power Engineering/Industry Applications

Thursday, March 21, 1991

Brooklyn's Saloon and Restaurant, 572-3999
2644 W. Colfax, Denver (under the viaduct)

6:00 p.m. Social
7:00 p.m. Dinner (optional @ \$10)
8:00 p.m. Meeting

Speaker

Hector Landa, Electrical Engineer
U.S. Bureau of Reclamation

"Geomagnetic Induced Currents"

Please contact Barbara at Peterson Company, 388-6322,
by Monday, February 18, 1990.

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Comments From The Region 5 Director

by John E. Martin

The Region 5 Executive Committee met January 12-13 in Dallas, Texas, to plan the Region activities for 1991. One of the major activities discussed was the Region Meeting and associated meetings to be held in Laramie, Wyoming, April 12-14, 1991 at the Laramie Inn. Activities planned for Saturday April 13th include the Region Meeting itself, the Region 5 Student Paper Contest, workshops for student branch counselors and student branch officers, and a Student-Professional Awareness Conference. The morning of Sunday April 14th will be devoted to New Section Officer Orientation. The format of both the Region Meeting and the New Section Officer Orientation will be changed this year from prior years. This year break-out sessions will be added to allow attendees to choose the topics of interest to them. All current section chairmen and incoming section chairmen are invited to both of these meetings. We hope every section will be represented.

National Engineers Week will be February 17-23 this year. The theme for this year is Discover "E", which focuses on engineering and the environment, with the goal of helping students to discover the excitement of engineering. National Engineers Week sponsors ask you to help motivate today's students to become tomorrow's engineers by helping to teach a math or science class at a local school or to initiate some other student program. Please help to make National Engineers Week a success in your section.

Several section leaders wrote to me expressing the opposition of their sections to the proposed reorganization

of IEEE as recommended to the Board of Directors by the Ad Hoc Volunteer Structure Committee (ADVOS 90). At its meeting in November, the Board of Directors rejected the recommendations of the ADVOS 90 Report and passed a resolution that no significant reorganization of the IEEE volunteer structure would be implemented without it first being submitted to the IEEE membership for its approval.

The number one issue identified at the Section's Congress 90 was the need to increase members' employers' support of IEEE activities. We in Region 5 have been endeavoring to build employers' support for the past few years by encouraging sections to hold IEEE Section Officers-Industry Executives Meetings. We have found these meetings an excellent opportunity to establish contacts with executives in our members' companies and to increase the executives' awareness of the programs and activities of IEEE and your local Section and Chapters. Whether or not your Section has held an IEEE Section Officers-Industry Executives Meeting in the past, I would urge you to hold one in 1991.



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Business card ads must be actual business cards. All other ads should be provided in camera-ready format or additional set-up charges may apply. Inserts must be provided (quantity approx. 4025) and delivered to the printer.

Deadlines

April 1991 Newsletter - March 6, 1991

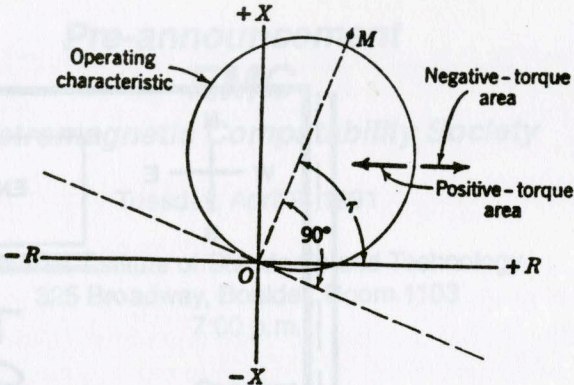
May 1991 Newsletter - April 5, 1991

Please make checks payable to Denver Section IEEE. Send business card or ad copy and check to:
Anita Wanberg, dba Trade Services, P.O. Box 4056, Englewood CO 80155-4056, (303) 220-8042.



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ENGINEERS, INC.

Denver Section



TRANSMISSION LINE PROTECTIVE RELAY SETTING SEMINAR

Sponsored by the Denver Section
Joint Power Engineering/Industry Applications Society

Instructor: William R. Roemish, PhD - Electrical Engineer,
Senior Staff Engineer, ARC Professional Services Group,
Associate Professor Adjunct, Univ. of Colorado at Denver,
Lecturer, WAPA's Electric Power Training Center,
Retired Chief, Electric Power Branch, Bureau of Reclamation

Content: A step by step method for setting relays to protect typical 230 KV transmission lines will be presented. Featured will be the SEL121H and the GEC Measurements OPTIMHO Systems. A notebook containing the overheads will be provided.

Date: Friday, April 5, 1991

Time: 8:00 AM - NOON (Coffee and donuts at 7:30 AM)

Location: Public Service Company, Rear Building Training Center,
5909 E. 38TH Ave., Denver, Co. 80207
(Refer to map on back for directions)

Enrollment is limited: 15 minimum - 40 maximum
For further information, contact Kevin Wright at (303) 431-7895

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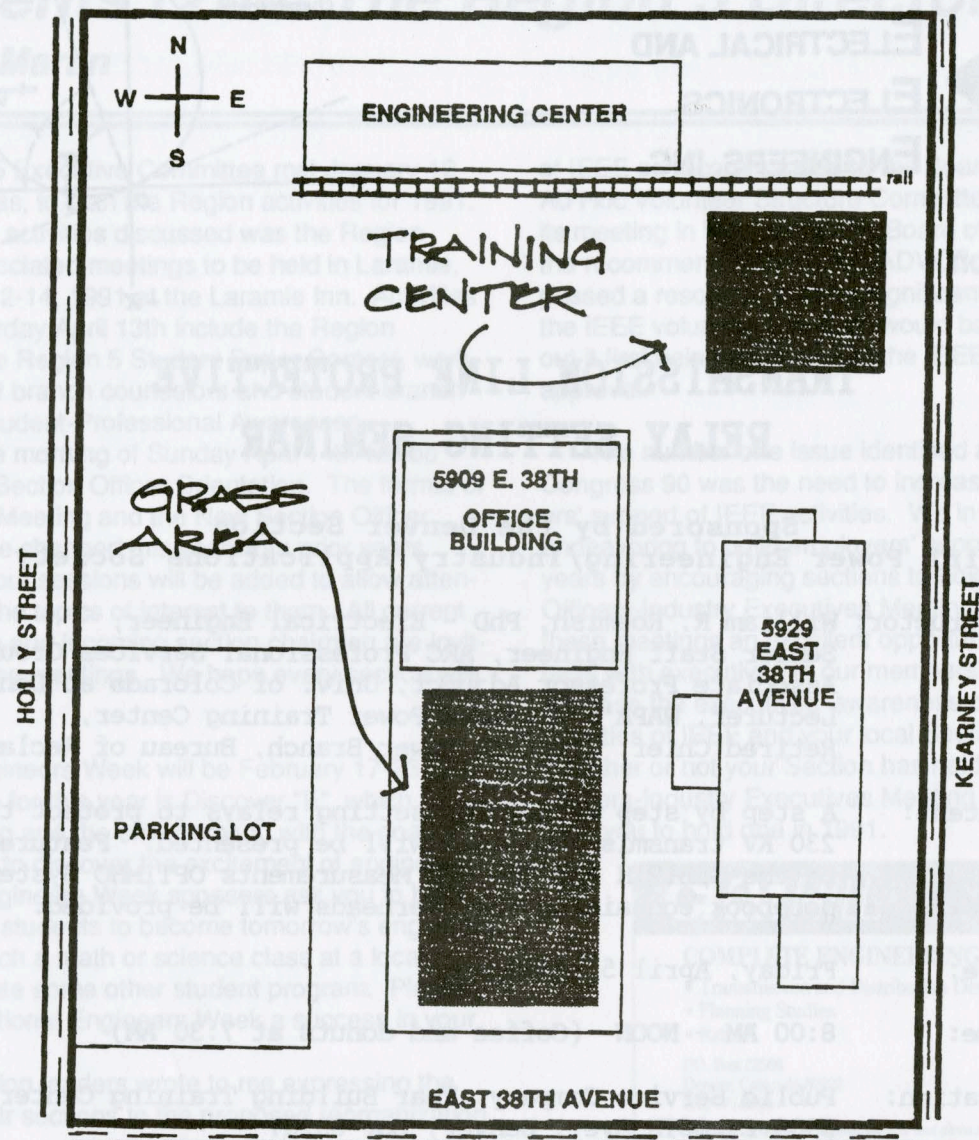
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Checks payable to: IEEE PES/IAS

Send checks with registration to:
Kevin Wright
Nelson Engineering, Inc.
P.O. Box 1265
Arvada, Co. 80001

Registration deadline is Friday, March 29, 1991



Parking: West of Training Center and Office Building
Entrance: Gate on Holly Street



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- Brock, Easley, Inc. - 1957 East "A" Street - Casper, WY 82601 - 307/235-0202 - Fax 307/472-5628
- Brock, Easley, Inc. 500 East Thomas Road, #230 - Phoenix, AZ 85012 - 602/234-2257 - Fax 602/234-2518
- Brock, Easley, Inc. - 5101 Copper NE, Suite 206 - Albuquerque, NM 87108 - 505/256-1300 - Fax 505/268-7871

Pre-announcement EMC Electromagnetic Compatability Society

Tuesday, April 9, 1991

National Institute of Standards and Technology
325 Broadway, Boulder, Room 1103
7:00 p.m.

Speaker

Robert Pearson, Ph.D.
Public Service EMS Group
Vice Chairman, Radiation Studies of the Task Force of the
Electric Power Research Institute (EPRI)

"Level of Activity & Status of Current EMF Research"

Theories on biological effects of low frequency magnetic fields will be explained. Studies will be presented including epidemiology cases involving childhood cancers brought on by the proximity of power lines.

There will be a short business meeting to discuss the June seminar and to elect the officers for the year.

Everyone is welcome. For more information call
Mark Lapchak, 773-4626 or Ev Evans 761-9447 for more
information.

University of Colorado at Denver

The Division of Extended Studies the Department of Electrical Engineering
present

Facilities Electrical Design and Practical NEC Applications (Part I)

Friday, April 5, 1991

Cost: \$225 per participant
\$200 per participant for two or more from same job site

This is another in our series of one-day, eight-hour short courses on topics in electrical power systems, machines, and energy. These programs serve as refresher courses and professional updates for practitioners in the electrical engineering field.

Call Arne Arnesen, CU-Denver Director of Corporate Programs, at (303)893-8521 to receive a program brochure and registration information.

Note: *Facilities Electrical Design - Part II* will be conducted on Friday, May 3, 1991. Individuals attending both courses will receive a 10% tuition discount on the May 3rd program. Ask for details when you call.

Clinical Engineering

by Matt Baretich

What is a clinical engineer? The simple definition is that he or she is an engineer practicing in the clinical environment. Most of the approximately 1,000 clinical engineers in the United States work in hospitals.

As a distinct profession, clinical engineering is perhaps 25 years old. Its roots go back to the period following World War II when expanding capabilities in electronics were applied in the healthcare system. Soon the theory-oriented specialty of Biomedical Engineering was established - followed closely by the application-oriented field of Clinical Engineering.

Most biomedical engineers do research and development in an academic or industrial setting; they help translate biomedical science into medical technology. Clinical engineers, working at the far end of the theory-application spectrum, use their engineering expertise to manage medical technology as it is actually used in the clinical environment.

To understand the role of the clinical engineer, one must consider two characteristics of the healthcare delivery system. First, the cost of healthcare in the United States continues to rise faster than the cost of other components of

our economy. This has resulted in a variety of cost-containment initiatives from government and the insurance industry. The success of these initiatives has been limited, but they have put considerable financial pressure on hospitals.

Second, medical technology is a major factor in the healthcare delivery system. Modern technology has enabled dramatic improvements in diagnosis and treatment, but it has also created ethical dilemmas with which society must wrestle. Technology has reduced costs in some cases (advanced imaging systems instead of exploratory surgery), but it is blamed for a substantial portion of healthcare cost increases.

Therefore, management of medical technology means working to insure safety (minimization of hazards for patients and staff), effectiveness (achievement of the desired clinical result), and economy (minimization of resource consumption in an era of cost-constraints). Comprehensive technology management requires the involvement of clinicians, hospital administrators, and clinical engineers. In recognition of this fact, many hospitals have established equipment management plans. In fact, the Joint Commission on Accreditation of Healthcare

Clinical Engineering continued . . .

Organizations has recently included a mandate for such plans in its hospital accreditation standards.

The major day-to-day activity for a hospital's clinical engineering department is medical equipment maintenance. Biomedical equipment technicians perform safety and performance inspections, preventive maintenance, troubleshooting, and repair of medical devices. In performing these services, technicians must adhere to strict technical standards and documentation requirements.

Less well-defined is the clinical engineer's role in technology assessment and acquisition. Increasingly, clinical engineers are part of the strategic planning process. Thus, the clinical engineer is involved in the entire equipment life-cycle - from planning for new technology through management of existing technology to disposition of outmoded technology.

As a result, the clinical engineer is both a specialist and a generalist. Clinical engineering education is often a specialization within biomedical engineering (albeit with the addition of coursework in management and clinical practice). On the other hand, clinical engineers must deal with a broad range of technologies and interact with a wide variety of non-engineering professionals.

Clinical engineering is a new profession and, as such, still shows signs of development and transformation. The challenge for the hospital-based clinical engineer (usually no more than one per institution) is to work independently in a complex and stressful environment. The personal and professional reward, however, is seeing engineering expertise produce better patient care.

Matthew F. Baretich, P.E., Ph.D., is Director of Bioengineering at the University of Colorado Health Sciences Center in Denver. He is President-Elect of the American College of Clinical Engineering. He is also Associate Editor for Clinical Engineering of the IEEE Engineering in Medicine & Biology Magazine.



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Schedule of Conferences and Meetings

February 3-8, 1991	Crested Butte	Aerospace Applications Conf.	Leo Mallette	(213) 334-2909
April 12-14, 1991	Laramie	Region 5 Conference	Richard Day	(714) 863-0350
April 28 - May 2, 1991	Boulder	PES Substation Com. Mtg.	Sadrul Ula	(307) 766-6268
June 17-19, 1991	Boulder	49th Device Research Conference	George Flaig	(303) 452-6111
June 23 - 27, 1991	Denver	International Communications Conf.	Bart Von Zeghbroeck	(303) 492-2809
October 10-11, 1991	Denver	Careers Conference	Russ Johnson	(303) 796-9100
May 11 - 13, 1992	Denver	Vehicular Technology Conf. (VTC '92)	Bill Whipkey	(303) 830-4713
October 7-11, 1991	Boulder	Ant. Meas. Techniques Assoc.	Don Cottrell	(303) 871-3752
Sept./Oct. 1994	Denver	IAS Annual Meeting	Mike Francis	(303) 497-5873
September 10-14, 1995	Denver	Petroleum & Chemical (PCIC)	Paul Meisel	(303) 469-2161
July, 1996	Denver	PES Summer Meeting	John Nelson	(303) 431-7895
May 1997	Denver	MTT	John Barnick	(303) 969-0391
			Hussain Haddad	(303) 460-2114
			John Dunn	(303) 449-1055
			Claude Weil	(303) 497-5305

Proposed Conferences and Meetings

International Conference on Harmonics in Power Systems (ICHPS) 1994
PES Joint Power Generation 1994
ESMO 1996
Sections Congress 1996
Transmission & Distribution 1997
ITC 2000

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Engineering in Medicine and Biology - Jochen Edrich, University of CO - Denver, 759-4002
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Magetics - Dr. Subrata Dey, Storage Tek, 673-6494
Power Electronics - Clyde Manning, Intellistor, 682-6492
Power Engineering - Kenneth McBryde, CO Ute Electric Assoc., 249-4501
Reliability - Rick Karcich, StorageTek, 673-6223

Senior Past Chairman Keith Henderson, Electric Power Testing, 650-2218

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The Month at a Glance

March 5, 1991

Joint ASA/Reliability Society Meeting

March 6, 1991

Executive Committee Meeting

March 14, 1991

Magnetics Society

March 15, 1991

Front Range Software Quality Meeting

March 20, 1991

EMB Meeting

March 21, 1991

AP/MTT/GRS Meeting

PES/IAS Meeting

Power Electronics Meeting

March 27, 1991

Executive Board Meeting

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