
January 1997

Rock River Valley Section
www.ieee.org/regional/section/rock_river/

Event



Sense

The Institute of Electrical and Electronic Engineers, Inc.

RRV Section & IAS/PELS Chapters Mtg Power Electronic Conversion The New Environment for AC Electrical

When February 3, 1997 (note:
MONDAY)

Where Rock Valley College, Tech-
nology Center, Room 117. Enter from
Mulford, just north of Springbrook Rd.

Agenda 6:00 PM Social Hour
6:30 PM Dinner - Buffet
7:30 PM Presentation

Speaker Prof. Donald Novotny, Uni-
versity of Wisconsin - Madison

Program AC electrical machines
have been developed over the past
100+ years to work in a constant fre-
quency, nearly constant voltage, sinu-
soidal waveform environment. Modern
power electronic converters have al-
tered this environment and made vari-
able frequency, variable voltage control
of AC machines a significant contribu-
tor to the overall field of electromechan-
ical energy conversion.

This new environment includes wide
variations in frequency and flux level,
very non sinusoidal excitation wave-
forms, very rapid changes in voltage
amplitude, frequency and phase and
other very non conventional operating
modes. The presentation will outline
portions of the historical development
of electronically supplied drives and
highlight a number of issues which
have caused problems in adapting ma-
chines to the new environment. This
includes such items as low frequency
instability, the effects of waveform har-
monics, the fallacy of directly applying

dc motor control concepts and the ul-
timate evolution of viable control princi-
ples based on "vector control" and reg-
ulated current excitation.

On the user side, the "user confusion"
created by the sudden availability not
only of the first highly efficient variable
speed AC drive equipment but also sev-
eral technical variants from which
choices needed to be made will also be
reviewed. There remains what will
probably be a perpetual mild state of
confusion and misinformation which is
periodically reinforced by the fairly rapid
evolution of the power switching device
and its impact on the technology and
economics of power converters. The
present day problems associated with
the generation of ground currents and
bearing currents will be used to illus-
trate the occurrence of new technical
and application problems stemming
from a technological advance and its in-
troduction to the marketplace.

Some comments on future directions of
research and commercial development
conclude the presentation.

Biography Donald W. Novotny re-
ceived the B.S. and M.S. degrees in
electrical engineering from the Illinois
Institute of Technology, Chicago, in
1956 and 1957 and the Ph.D. degree
from the University of Wisconsin Mad-
ison in 1961.

From 1961 to 1996 he was a member
of the faculty at the University of Wis-
consin Madison. At his retirement he was
Grainger Professor of Power Electronics

and founder and Co director of the Wiscon-
sin Electric Machines and Power Electron-
ics Consortium (WEMPEC). He is the co
author of two textbooks on electromechan-
ical systems and has published over 100
technical articles on electric machines,
variable frequency drives and power elec-
tronic control of industrial systems. He also
served as Chairman of the Electrical and
Computer Engineering Department and as
an Associate Director of the University In-
dustry Research Program. He has been
active as a consultant to many organiza-
tions and a Visiting Professor at Montana
State University, the Technical University
of Eindhoven, Eindhoven, Netherlands, the
Catholic University of Leuven, Leuven, Bel-
gium and a Fulbright Lecturer at the Univer-
sity of Ghent, Ghent, Belgium.

Dr. Novotny is an IEEE Fellow and a mem-
ber of ASEE, Sigma Xi, Eta Kappa Nu and
Tau Beta Pi and is a Registered Profes-
sional Engineer in Wisconsin.

Door Prizes Sponsored by RRVs

Meal Dinner will be buffet style (with
a min. of 15 people) featuring Chicken
and Ham or Roast Beef. Please make
your **dinner reservations** by calling
**Gloria at 815-226-5247 by Thurs-
day, January 30, 1997.** The cost of
the **dinner** is **\$4.00** for IEEE members
and **\$10.00** for non-members. Unem-
ployed members may call one of the of-
ficers for special arrangements.

Note The meeting is open to the general
public. You need not be an IEEE member.
However, please call to enable us to make
proper arrangements.

Joint IEEE RRVs/ASME Mtg

Topic The Practice of Engineering in the Information Age

Speaker Dr. Avram Bar-Cohen, professor of Heat Transfer at the University of Minnesota

When Tuesday, February 18, 1997

Where Rock Valley College, Technology Center, Room 117.

Agenda 6:00 PM Social Hour
6:30 PM Dinner - Buffet
7:30 PM Presentation

Meal Tenderloin beef tips burgundy and baked cod. Cost is \$8 for IEEE members and \$16 for others.

Contact Gloria @ 815-226-5247 by Feb 10.

RRVS To Celebrate 50 Year Anniversary at March Mtg

At the March meeting, the RRVs celebrates its 50th year as a section. In celebration of this event a special dinner at Rock Valley College will be held featuring hand-carved roast beef and baked orange roughy. In addition, Dr. Steigerwald from General Electric's Research Center in Schenectady, N.Y., will speak on advances in distributed power systems for electronic equipment. There will also be a 50 year anniversary brochure with interesting anecdotes from the past five decades. IEEE Region 4 officers will also join us.

IEEE and IEE Sponsor 1997 Faraday Lecture

The IEEE, in conjunction with the Institution of Electrical Engineers (IEE), will broadcast the 1997 Faraday Lecture on February 4, 1997. This lecture will be simulcast via satellite so that students around the world will be able to participate in this event.

The 1997 lecture—tentatively entitled, "But what's the use of it, Mr. Faraday?"—will demonstrate the concept of electromagnetism and show how it is used in a variety of ways in medicine, industry, commerce, and leisure. Engineers have built on Faraday's discovery to develop systems that influence our daily lives to an extent we seldom realize.

The Faraday Lectures, begun in 1924, are designed to introduce secondary school students to the field of electrical engineering through a lively hour-long program which combines background, demonstrations, experiments, and explanations of cutting-edge technology. Schools may receive the hour-long, free broadcast via a satellite downlink. The program will be simulcast live to both C-band

and KU-band satellites. Teachers are given a workbook for duplication and distribution to students. Teachers may tape and retain this program indefinitely. Tapes of past broadcasts are also available for purchase.

Though the lectures are primarily geared to students in grades 10-12, students of almost any age enjoy seeing the fascinating demonstrations of technological developments as well as the dazzling special effects. Teachers of grades six through college registered their classes for the lecture that aired last February and reported an excellent response from their students.

The Faraday broadcast is intended to build a relationship between the IEEE and the pre-college educational community, and teachers of science, technology, and math. This broadcast highlights the benefits of engineering as a career and the importance of society membership to the engineer. IEEE Sections frequently volunteer engineers to be available in person following the broadcast to answer students' questions, thus introducing prospective engineering students to potential mentors. IEEE Sections can also help identify locations of local satellite downlink sites.

For information on how to receive the Faraday broadcast, contact IEEE, (908) 562-5485; faraday-program@ieee.org.

RRVS' Web Site

by Paul Peterson

With the help of Professor Don Zinger and the Northern Illinois University's College of Engineering and Engineering Technology Computing Systems staff, the IEEE Rock River Valley Section has established it's own little existence on the WWW (www.ieee.org/regional/section/rock_river/).

The project began in October, 1995, through the help of Dr. Zinger at NIU. An account was established on their web server such that the section could begin their venture into HTML programming, Hyperlinks, Graphics, and instant access to Section information. Paul Peterson and Bob Parro of the RRVs have been constantly striving to make the site more useful. Initially the site contained a few facts about the RRVs and their officers, with links to officer's e-mail and hyperlinks to other sites of interest. It has now transmogrified into a wide collection of links, meeting announcements and summaries, meeting pictures and links to the section's society chapter pages. It recently received praises from IEEE Region 4 officers for being a well-designed, content-rich, informative site.

Chicago/Rockford Consultants Mtg

The Chicago/Rockford Consultants Network consists of members from Northern Illinois (mostly Chicago, Chicago suburbs, and Rockford), and Wisconsin, Indiana, and Michigan. Membership is open to all consultants including non-electrical engineers and non-IEEE members. The Network web site address is <http://www.drblank.com> then select The World's Most Visited Consulting Engineering Mall.

The next meeting will be on January 27, 1997, 7:30-9:00 P.M. at the Palatine Public Library. The Library is located on North "North Street" (two blocks behind Bakers Square) which is about two miles west on Northwest Highway 14 from the 290/53 off-ramp. Everyone is welcome. For more information contact Harv Brodsky (847-222-1747).

November Meeting Recap

John Ghrist, author and historian of radio broadcasting (pictured below), gave an interesting talk at the RRVs Student Branch at NIU in DeKalb about the history of radio in Northern Illinois.

February Meeting Preview

The tentative February meeting topic is Hybrid Electric Vehicle Technology by Robert Larsen of Argonne National Laboratories.

Submissions to *Event Sense*

Send articles and job ads to the *Event Sense* editor, Bob Parro, via e-mail (preferred), or fax. Job ads will run for two consecutive months. Contact the *Event Sense* editor if the ad needs to run longer. Please make submissions by the twenty-fifth of the month. All submissions are subject to editing for style, clarity, and space considerations.

e-mail: b.parro@ieee.org
fax: (815) 394-2497

RRVS Executive Committee

(l-r) standing: Larry Wachowiak, Treasurer; Hassan Mansir, IAS Chair; Don Zinger, NIU Student Branch Counselor; Matt Zimmer, Secretary and IAS Vice Chair; Roger Caruana, Education Chair; seated: Caio Ferreira, Past Section Chair, Bob Parro, Section Chair; Bill Barber, Membership Chair; Mark Harris, Past Secretary; Paul Peterson, Awards Chair

The Rock River Valley Section would like to give recognition to the following area companies and university for supporting Section Officers:

Sundstrand Corporation • 3C Computer Systems • William Barber & Associates • Northern Illinois University

Rock River Valley Section of the IEEE 1996-1997

[WWW: www.ieee.org/regional/section/rock_river/]

Elected Executive Committee

| | | | |
|------------|-----------------|----------------------|----------------|
| Chair | Bob Parro | b.parro@ieee.org | (815) 394-2947 |
| Past Chair | Caio Ferreira | c.ferreira@ieee.org | (815) 394-2903 |
| Vice-Chair | Bill Barber | b.barber@ieee.org | (815) 235-4110 |
| Secretary | Matt Zimmer | m.zimmer@ieee.org | (815) 394-3456 |
| Treasurer | Larry Wachowiak | l.wachowiak@ieee.org | (815) 394-5676 |

Appointed Executive Committee Chairs

| | | | |
|------------------------------|-----------------|------------------------|----------------|
| IAS Chapter Chair | Hasan Mansir | h.manisr@ieee.org | (815) 226-6875 |
| IAS Chptr. Vice Chair | Matt Zimmer | m.zimmer@ieee.org | (815) 394-3456 |
| Comp/CS Chapter Chair | Paul Peterson | paul.peterson@ieee.org | (815) 226-2584 |
| PELS Chapter Chair | Jim Buerosse | j.buerosse@ieee.org | (815) 226-6078 |
| Educational Activities | Roger Caruana | r.caruana@ieee.org | (815) 332-4606 |
| Technical Activities | Roger Caruana | r.caruana@ieee.org | (815) 332-4606 |
| Membership | Bill Barber | b.barber@ieee.org | (815) 235-4110 |
| Awards | Paul Peterson | paul.peterson@ieee.org | (815) 226-2584 |
| Publicity, Newsletter Editor | Bob Parro | b.parro@ieee.org | (815) 394-2947 |
| Nominations | Matt Zimmer | m.zimmer@ieee.org | (815) 394-3456 |
| RRVS Jubilee | Larry Wachowiak | l.wachowiak@ieee.org | (815) 394-5676 |

Northern Illinois University - Student Branch Officers

| | | | |
|------------------|------------------|-------------------|----------------|
| St Br Counselor | Prof. Don Zinger | d.zinger@ieee.org | (815) 753-0706 |
| St Br Chair | Jeff Ciarlette | | |
| St Br Vice-Chair | Chris Stegh | | |
| St Br Secretary | Rob Reeder | | |
| St Br Treasurer | Ryan McMillin | | |

Messages for student officers can be left at the NIU Dept of Electrical Engineering,
(815) 753-9974 or e-mail at sb.niu@ieee.org



Rock River Valley Section
Established 1947

Internet Access For \$5/mo

Obtain text-based Internet access from the Sinnissippi Valley Freenet. Ideal for Commodore 64, Apple 2 and VT100 terminal users that don't have graphics capability. Access Winnebago County tax information. Send/receive e-mail. Contact Carol Ford at:
sinnfree@sinnfree.org

Calendar

- January Section Meeting** **MONDAY, Feb 3**
Power Electronic Conversion - The New Environment for AC Electrical Machines, Prof. Donald Novotny
- Joint IEEE RRVS/ASME Meeting** **TUESDAY, Feb 18**
The Practice of Engineering in the Information Age, Dr. Avram Bar-Cohen, Univ of Minnesota
- February Section Meeting** **TBD**
Hybrid Electric Vehicle Technology, Robert Larsen, Argonne National Laboratory's Center for Transportation Research
- March/RRVS Jubilee Section Meeting** **Thursday, Mar 27**
Advances in Distributed Power Systems for Electronic Systems, Dr. Steigerwald, GE Research Center
- April Section Meeting/Tour** **Thursday, April 24**
Byron Nuclear Power Plant



IEEE



Joint Computer/Control
Systems Society Chapter
Established 1995



Industry Applications
Society Chapter
Established 1992



Power
Electronics
Society
Chapter
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