**IEEE NORTH JERSEY SECTION SEMINAR**
**VISUAL BASIC**
**TUESDAYS, SEPTEMBER 17 THROUGH DECEMBER 3, 1996**
**GPU ENERGY**
**300 MADISON AVENUE**
**MORRISTOWN, NEW JERSEY**

The North Jersey Section is offering an evening course entitled "Visual Basic." This comprehensive course is intended for novice programmers and programmers migrating from procedural languages to Visual Basic. The prerequisites for the course are a familiarity with the Windows Operating system (version 3.1 or preferably Windows 95), knowledge of a procedural language (i.e., Basic, C) and programming concepts, access to Microsoft Visual Basic as well as Microsoft Windows 3.1 Windows 95.

Upon course completion, students will understand event-driven programming; standard control objects and their associated properties, methods and events; have the ability to design application solutions.

There will be 11 weekly interactive lectures. Homework will be assigned and corrected. The instructor is Paul Mazur, a member of the staff of a large communication company and a part-time consultant and instructor in computer programming. The topics listed below will be covered.

- Introduction to Visual Basic; Naming Conventions; Creating a Graphical User Interface (GUI); Properties, Events & Methods for Forms, Text Boxes, Command Buttons and Labels; Event Procedures; Variable Declarations; Environment Options; Saving programs
- Variables & Constants; Constant.txt File; Code Modules; Expressions & Statements; Procedures & Functions; Passing data by reference or by value; Built-in Functions; Static variables; Scope of variables.
- Properties, Events & Methods for Lines, Shapes, Check Boxes, Option buttons, Frames, Picture Boxes and Images; ToolBar; StatusBar, ZOrder, Program Flow constructs, Finite Arrays, Dynamic Arrays; Control Arrays.
- Properties, Events & Methods for List Boxes and Combo Boxes.
- Properties, Events & :Methods for Horizontal/Vertical Scroll Bars and Timers; DOS File commands; File Handling Functions; File System Controls (Drive Director and File List Boxes); File I/O; Common Dialog Boxes.
- Multiple Form Projects; Error Trapping & Handling; Debug Tools
- Data Manager & the Data Control; Data-aware controls; Grid Control
- Multiple Document Interface (MDI) Forms; Menu Design.
- Mouse Events; Keyboard Events; Drag & Drop; Dynamic Link Libraries (DLL).
- Clipboard; Dynamic Data Exchange (DDE); Shell Functions; DoEvents Function; Object Linking & Embeding (OLE).

Class size will be limited to a maximum of 25 with a minimum of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after September 11, 1996 will require an additional late fee of $25. No reservations will be accepted after September 11, 1996.

**WHERE:** GPU Energy, 300 Madison Avenue, Morristown, N.J.
**WHEN:** Eleven sessions, Tuesday evenings starting September 17, 1996, 6:30 PM to 9:00 PM
**COST:** IEEE Members $250; Non-IEEE Members $350
**CONTACT:** Mr. John Baka at (201) 455-8534 (business)

**REGISTRATION "VISUAL BASIC"**

To: Mr. John Baka, Distribution Engineering, GPU Energy, 300 Madison Avenue, Morristown, NJ 07962-1911

Name _____ IEEE No. _____

Affiliation No. _____ Phone Number _____

Address _____

_____

Please enclose required fee payable to **North Jersey Section IEEE**

Signature _____

The IEEE
# Newsletter

**PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS**

*NJ Section PACE:*
## The Death Of Destructiveness

On August 8, 1996, the NJ Section's Prfessional Activities Committee for Engineers will present a talk on "The Death Of Destructiveness: Technology's Promise For the New Millennium." The speaker will be Anthony Gardner.

**About The Talk**

The metaphor of war forms the central core of societal consciousness, saturating even the most innocuous issues. A natural outgrowth of this mind-set has been the application of scientific and technological knowledge to warfare. A peculiar by-product of increasingly lethal warfare has been gradual, but positive societal shifts.

The past decade has seen the birth of an unprecedented opportunity. The promise of a societal shift which could lead to a world without the fear of scarcity and limited resources. Removing the cause of these fears can clear the way to eliminating mankind's greatest shortcoming, his legacy of horrific destructiveness toward the life, property and potential of his neighbors.

Although technology cannot decide moral questions, it can serve to illuminate new vistas. Our challenge for the new millennia will be whether the tools coming to our nation's service will be used to retire a bitter foe or to simply fortify the status quo.

**About The Speaker**

Anthony Gardner has spent over 20 years in industrial design and production environments focusing on control system integration. He earned his BS in Engineering (ME/EE) from General Motors Institute in 1982. His future plans include graduate study in electrical/computer engineering and greater IEEE and community activity.

**Time:** 7:30 PM, Thurs., August 8, 1996.
**Place:** JCP&L Co., 300 Madison Ave., Morristown, NJ.
**Information:** Dr. Robert Sinusas (201) 228-3941.

*NJ MTT/AP Chapter:*
## Photonics For Microwave Systems

The topic at the August 14, 1996 meeting of the IEEE NJ Section MTT/S/AP-S Chapter, will be "Photonics For Microwave Circuits And Systems." The speaker will be Dr. Arthur Paolella.

**About The Talk**

The advantages of using photonics in microwave systems are the availability of low loss fiber for signal distribution, and a reduction in size and weight of signal distribution networks for phased array antennas. High speed analog fiber optic links are being developed for signal distribution in cable TV, satellite and for radar target simulators. Optical injection locking techniques are being used to control MMIC oscillator circuits to send data and control phase. Optical microwave mixing is being applied for up and down conversion of microwave signal in antenna remoting. New types of photodetectors such as heterojunction bipolar phototransistors have been developed to improve the performance of fiber optic links

**About The Speaker**

Dr. Paolella is a member of the US Army Communications-Electronics Command, R&D Center, Space and Terrestrial Communications Directorate, Ft. Monmouth, NJ. He is responsible for the in-house research and development activities in the area of photonics and microwaves. From 1982 to 1995 he was at the Army Research Laboratory, Physical Sciences Directorate, Ft. Monmouth, NJ where he was involved in the research and development of microwave and millimeter wave and photonic devices and circuits. Dr. Paolella has developed and patented methods for optically controlled microwave circuits. He recently worked on the development of quasi-optic circuits. Dr. Paolella received his Ph.D. degree from Drexel University, Philadelphia, in 1992, and MS and BS degrees from Fairleigh Dickinson University (1985), and Monmouth University (1982). In 1987 he was awarded an Army Fellowship to study and do research at Drexel University.

Dr. Paolella has over 70 publications in journals and conference proceeding and one book chapter. He has 15 US patents and 1 Canadian patent. Dr. Paolella is a Senior Member of the IEEE and Chairman of the New Jersey Coast Section IEEE and MTT Society.

**All Welcome**

You do not need to be an IEEE member to attend. Free refreshments will be provided starting at 6:15 PM.

**Time:** 7:00 PM, Wednesday, August 14, 1996.
**Place:** GEC-Marconi, Plant 11, 164 Totowa Road, Wayne, NJ.
**Reservations/Information:**
Dr. Chandra Gupta (201) 633-4469 (GEC-Marconi); Willie Schmidt (201) 492-0371; Dr. Arthur Paolella (908) 427-2825 (US CECOM).

# AUGUST, 1996
## Volume 43, Number 2
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**NEWSLETTER STAFF**

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Business Manager..... A.M. Beattie

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**IEEE NJ SECTION HOME PAGE**
**WWW at http://hertz.njit.edu/~ieeenj**

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IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, (908) 981-0060. It is not necessary to inform the North Jersey Section when you change your mailing address. "The IEEE Newsletter" and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.




***The North Jersey Section Executive Committee usually meets the first Wednesday (except holidays and December) of each month at 7:00 PM. Meetings are open to all members. For information on meeting agenda call Sergei Bogaenko (201) 785-3673* (H).**

*NJ Section PACE:*

## The 21st Century Engineer

At the September 12, 1996 meeting of the NJ Section's Professional Activities Committee for Engineers, the topic will be "The 21st Century Engineer." The speaker will be Wallace S. Read, President of IEEE, who will develop this theme in the context of new programs being established by IEEE for its members, in particular those relating to continuing education.

**About The Talk**

The next millennium will see a vastly changed environment for the engineer. We are already witnessing tremendous upheavals in the universities that train engineers, in the industries that employ engineers and in governments who set the rules and to a large degree have funded basic research by our professionals.

All these institutions are positioning themselves so that they will survive and flourish in the next century. With respect to engineers in industry, one eminent IEEE member wrote recently:

"Things have changed in industry and in engineering over the past few years. Industrial concerns have succeeded in shortening product cycles to an amazing degree. Products that formerly took two years or more for design and first production now hit the market in a half a year.

"Further, product quality is higher, product cost is lower, and variations are easier and less costly to get. This has been done in the face of widespread corporate downsizing that has resulted in smaller engineering groups.

"This portends changes in the career patterns of engineers. It may even portend the need for fewer engineers per unit of gross domestic product if the phenomenon continues to grow. Corporate leaders are already saying that lifetime employment is largely a thing of the past and in future will be the exception rather than the rule. Rather than work for one or two employers over the course of a career, some engineers may find that a career consists of working for companies on the basis of a project at a time."

We are truly molding a new engineering culture from which will arise the 21st century engineers.

**About The Speaker**

Born in Newfoundland, Canada, Dr. Read received his Bachelor of Engineering from Nova Scotia Technical College in 1951 before entering the pulp and paper and hydro-electric power industries in his native province. Between 1964 and 1984, he held senior positions with Newfoundland and Labrador Hydro including executive vice-president, president of Churchill Falls (Labrador) Corporation, and president and chief executive officer of the Lower Churchill Development Corporation.

In 1985, he joined the Canadian Electrical Association (CEA) serving as its first full time President. In that position, Read worked to promote the interests of electric utilities and the customers they serve and acted as spokesperson on issues of national concern to the electric utility industry. Upon retirement from CEA, Read accepted an appointment as Commissioner of the Public Utilities Board of Newfoundland and Labrador.

In addition to these responsibilities, he is Chairman of the Canadian Centre for Marine Communications and a member of the Standards Council of Canada.

His professional affiliations include being a Life Member of the Association of Professional Engineers and Geoscientists of Newfoundland, a Fellow of the Engineering Institute of Canada and of the Institute of Electrical and Electronics Engineers (IEEE).

He has received numerous awards including IEEE's General A.G.L. McNaughton Gold Medal, the Engineering Institute of Canada's Julian C. Smith Medal and Doctor of Engineering Degrees (Honoris Causa) from the Technical University of Nova Scotia and Memorial University of Newfoundland.

Dr. Read has been active in many IEEE areas including various Committees and Boards; and Regional Council; Sections and Conferences activities

He was elected President for 1996 after serving as President-Elect (1995), Region 7 Director (1984-1985), Secretary (1988), Treasurer (1989-1990), and Vice President-Standards Activities (1993-1994).

**Time:** 7:30 PM, Thurs., September 12, 1996.
**Place:** JCP&L Co., 300 Madison Ave. and Punch Bowl Road, Morristown, NJ.
**Information:** Dr. Robert Sinusas (201) 228-3941.

## Do Something August In August

Get an application and information on becoming a Senior Member by contacting Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, NJ 07605-2239, (201) 461-0900, ext. 234 mornings or Amy Bissmeyer, Videx Equipment Corp., 170 Railroad Avenue, Paterson, NJ 07501, (201) 742-2381, ext. 24.

**IEEE NORTH JERSEY SECTION SEMINAR**
**OBJECT-ORIENTED C++ PROGRAMMING**
**MONDAYS, SEPTEMBER 16 THROUGH DECEMBER 5, 1996**
**GPU Energy, 300 Madison Avenue, Morristown, New Jersey**

The North Jersey Section IEEE is offering an evening course entitled "Object-Oriented C++ Programming." The Object-Oriented concept is very widely used today in new design and programming work. Instead of focusing on functionality (what the programs do), it focuses on the natural objects comprising the problem and how they, and their capabilities, are modeled in the program. C++ is, by far, the most widely used language today for object-oriented design and programming. But 0-0 programming is still programming so the course will begin with the elements of procedural programming using C++ as a better C language. It will then move on to Object-Oriented programming. The course will cover concepts, implementation and practical aspects of using C++ code. A knowledge of C programming is not necessary to take the course, but, because neither C nor C++ are elementary programming languages, a familiarity with foundation programming concepts will be very helpful. The course will be compatible with both the Microsoft and the Borland development packages.

There will be eleven weekly lectures and homework will be assigned and corrected. The topics listed below will be covered. The instructor is Dr. Edward (Ted) Byrne, owner of a software consultant business.

**TOPICS**

(1) Review common elements of C and C++: punctuation and key words, variable naming, type and scope, libraries, text strings, arrays, structures and pointers.
(2) C++ procedural programs: conditionals and logical variable,s looping and testing, subfunctions and arguments. Debugging.
(3) Concept of Object-Orientation: objects and classes of objects, methods and messages, encapsulation and abstraction, overloading of functions and operators, inheritance and polymorphism.
(4) C++ improvements to C: new commands and operators, comments, stream I/O, function prototypes, more explicit typing and linking.
(5) C++ implementation of objects: what is a C++ object, data and method functions within an object, public, private and friend, static and dynamic objects, constructors and destructors.
(6) Encapsulation and abstraction within C++ objects: references and aliases, scope control operator, 'this' object, overloading, functions, operators.
(7) Inheritance and polymorphism among C++ objects: parent class or object, extending classes, redefining object data and methods, multiple inheritance.
(8) C++ I/O streams: standard I/O, formatted I/O with manipulators, disk and device I/O.
(9) C++ library classes and their use: characteristics of a good library class, conversion base classes, video base classes, window base classes, database base classes.
(10) Overall program structure with C++ objects: how to lay out a C++ program, how to reuse classes in a program, how to test and evolve a C++ program, how to find errors and debug C++ object programs.
(11) Recent topics: object-oriented design methodologies, templates and the standard template library, namespaces and interactive program design.

Class size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after September 9, 1996 will require an additional late fee of $25. No reservations will be accepted after September 12, 1996.

**WHERE:** GPU Energy, 300 Madison Avenue, Morristown, N. J.
**WHEN:** Eleven sessions, Monday evenings, starting September 16, 1996, 6:00 PM to 8:30 PM
**COST:** With Text Book and Borland Turbo C++ Compiler, IEEE Members $300, Non-IEEE Members $400
With Text Books only, IEEE Members $200; Non-IEEE Members $300
**CONTACT:** Mr. John A. Baka at (201)455-8534 (Business)

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**REGISTRATION "OBJECT-ORIENTED C++ PROGRAMMING"**

TO: Mr. John Baka, Distribution Engineering, GPU Energy, 300 Madison Avenue, Morristown, NJ 07962-1911

Name _____ IEEE No. _____

Affiliation _____ Work Phone No. _____

Address _____

_____

Check if Borland Turbo C++ COMPILER IS NEEDED OR NOT. YES [ ] NO [ ]
Please enclose required fee made payable to "North Jersey Section IEEE"

Signature _____

# Graduate Less Than Ten Years Ago?

Congratulations! You belong to a select group that feels IEEE to be a resource in their professional and technical development. Unfortunately, four years out of school, only 17% of those who were IEEE Student Members have maintained membership. Why is that so? The reasons are as varied as why people say they stay in IEEE a lifetime.

For years IEEE has struggled to keep in touch with recent graduates: figuratively as well as just having a correct mailing address. Non-technical section meetings rarely specifically feature topics of interest to young professionals. Too often, this group "slips through the cracks."

We're hoping to change that with a new effort targeting the membership needs and interests of these G.O.L.D. (Graduates of the Last Decade) members. IEEE is the unquestioned authority on technical developments in the field of electrotechnology. A whole other side of IEEE, just as important, is focused on professional development, career-growth and ethics. The G.O.L.D. program seeks to extend the "non-technical" side of IEEE to young professionals in particular.

We're looking for ideas. Could you take just a moment, and respond (by e-mail, phone, or fax) with any input at all? Do you have colleagues at work that might be interested? G.O.L.D. is quite definitely open to ANY young electrical engineering professional. Doing what comes naturally to so many other groups within IEEE, we plan to get together and share ideas and experiences. We'll certainly be calling on the expertise of more established members, besides being resources for perhaps even newer faces out of school. We'd like to introduce members and nonmembers to the powerful opportunity the IEEE can be for growing your career. Some meeting topics being considered include: Networking, Mentors, and Career Paths. Do these interest you? Would you attend a meeting? Would you like to get involved?

Please respond to North Jersey G.O.L.D. Chair Ms. Amy Galarowicz (Class of '89) at a.bissmeyer@ieee.org or work phone (201) 742- 2381, ext. 24, or fax 742-1452. Watch this newsletter for more details as they develop. First meeting is planned for Sept./Oct.

# North Jersey Section Activities August 1996

**Aug. 7**—"NJ Section Executive Committee Meeting"—7:00 PM, Plant 11, GEC-Marconi, 164 Totowa Road, Totowa, NJ. Sergei Bogaenko (201) 785-3673 (H).

**Aug. 8**—"The Death Of Destructiveness"—NJ PACE, 7:30 PM, JCP&L Co., 300 Madison Ave. & Punch Bowl Rd., Morristown, NJ. Robert Sinusas (201) 228-3941.

**Aug. 14**—"Photonics For Microwave Systems"—IEEE NJ Section MTT/S/AP-S Chapter, 7:00 PM, GEC-Marconi, Plant 11, 164 Totowa, NJ. Dr. Chandra Gupta (201) 633-4469 (GEC-Marconi).

## Upcoming Meetings

**Sept. 4**—"NJ Section Executive Committee Meeting"—7:00 PM, Plant 11, GEC-Marconi, 164 Totowa Road, Totowa, NJ. Sergei Bogaenko (201) 785-3673 (H).

**Sept. 12**—"The 21st Century Engineer"—NJ PACE, 7:30 PM, JCP&L Co., 300 Madison Ave. & Punch Bowl Rd., Morristown, NJ. Robert Sinusas (201) 228-3941.

**Sept. 16-Dec. 5**—"Object-Oriented C++ Programming"—North Jersey Section, Monday evenings, 11 sessions, 6:00-8:30 PM, GPU Energy, 300 Madison Ave., Morristown, NJ. John A. Baka (201) 455-8534.

**Sept. 17-Dec. 3**—"Visual Basic"—North Jersey Section, Tuesday evenings, 11 sessions, 6:00-9:00 PM, GPU Energy, 300 Madison Ave., Morristown, NJ. John A. Baka (201) 455-8534.

**Sept. 18-Nov. 13**—"Introduction To UNIX"—North Jersey Section, Wednesday evenings, 8 sessions, 6:00-9:00 PM, GPU Energy, 300 Madison Ave., Morristown, NJ. John A. Baka (201) 455-8534.

**Sept. 19**—"One-Day Seminar: Grounding, Shielding, And Surge Protection Of Microelectronics Equipment Used In Protection, Control, And Instrumentation Systems"—NJ IAS/PES Chapters, 8:30 AM - 3:30 PM, JCP&L Hq., 300 Madison Ave., Morristown, NJ. Dick McFadden, (212) 239-8510.

**Oct. 2**—"NJ Section Executive Committee Meeting"—7:00 PM, Plant 11, GEC-Marconi, 164 Totowa Road, Totowa, NJ. Sergei Bogaenko (201) 785-3673 (H).

**Oct. 17**—"One-Day Seminar: Getting The Most Out Of Your Electric Power System"—NJ IAS/PES Chapters, 8:30 AM - 3:30 PM, JCP&L Hq., 300 Madison Ave., Morristown, NJ. Dick McFadden, (212) 239-8510.

**Nov. 21**—"One-Day Seminar: Short Circuit Analysis"—NJ IAS/PES Chapters, 8:30 AM - 3:30 PM, JCP&L Hq., 300 Madison Ave., Morristown, NJ. Dick McFadden, (212) 239-8510.

**Members and Non-Members Welcome**

**PLEASE POST**

# AT THE SCHOOLS

### County College of Morris IEEE Student Branch

Until last January, the IEEE Student Branch at County College of Morris was an organization bound for termination due to lack of participation. Branch officers were nonexistent and members had no meetings. Dan Schkeeper, the current branch chairman, came forward and within one month, dramatic changes took place; weekly meetings with attendance rising from 4 to 23 active members. Finding it helpful to communicate with the North Jersey Executive Committee, a presence at monthly EXCOM meetings has been maintained by Dan Schkeeper, Brian Binovsky, 2nd vice chair, and James Binovsky, professional relations chair.

The student branch felt it needed to establish itself around the CCM campus, and at the same time encourage the entire school to focus on topics relating to electronics engineering technology. The student branch purchased, and donated to the CCM Library, an instructional video on the fundamentals of telecommunications. Last semester, the branch hosted speakers, including: "Troubleshooting Analog and Digital Circuits" by Mel Lewis, "IEEE and the New Engineer" by Amy Bissmeyer, and "How to Effectively Market Yourself" by Wayne Daniel. Also, many members enjoyed a branch-sponsored trip to Electro '96.

Branch leadership from the Spring semester is growing and continues to schedule events for upcoming semesters. Anyone interested in making a presentation, including other student IEEE members, are welcome to contact Dan Schkeeper at:

d.g.schkeeper@ieee.org.

Our members look forward to another successful year's worth of activities.

## IEEE NORTH JERSEY SECTION SEMINAR
## INTRODUCTION TO UNIX
## WEDNESDAYS, SEPTEMBER 18 THROUGH NOVEMBER 13, 1996
**GPU Energy, 300 Madison Avenue, Morristown, New Jersey**

The North Jersey Section IEEE is offering an evening course entitled "Introduction to UNIX." Knowledge of C Language is helpful but not required.

There will be eight weekly lectures and homework will be assigned and corrected. The topics listed below will be covered. The Instructor is Jim Gershfield, a Senior Systems Engineer at EDS.

TOPICS

(1) Introduction to UNIX. The many flavors of UNIX. UNIX concepts. History of UNIX. UNIX hardware. UNIX and MS-DOS.
(2) UNIX commands. Shell programming: Bourne Shell, C Shell and Korn Shell. The UNIX manuals.
(3) More UNIX commands. UNIX editors: ex and vi. The AWK language.
(4) C programming for UNIX. cc, make, lint, grep.
(5) Advanced C programming: fork, exec, inter-process communication, shared memory, pipes.
(6) UNIX System Administration: managing users, disks, tapes, system activity, security.
(7) Interface programming for UNIX: Curses, X-Windows. UNIX database systems: Oracle, Informix. Application software.
(8) Advanced topics: device drivers, security, networking and the Internet, file systems, troff.

Class size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after September 11, 1996 will require an additional late fee of $25. No reservations will be accepted after September 16, 1996.

**WHERE:** GPU Energy, 300 Madison Avenue, Morristown, N. J.
**WHEN:** Eight sessions, Wednesday evenings, starting September 18, 1996, 6:30 PM to 9:00 PM
**COST:** IEEE Members $250, Non-IEEE Members $350
**CONTACT:** Mr. John A. Baka at (201)455-8534 (Business)

### REGISTRATION "INTRODUCTION TO UNIX"

TO: Mr. John Baka, Distribution Engineering, GPU Energy, 300 Madison Avenue, Morristown, NJ 07962-1911

Name _____ IEEE No. _____

Affiliation _____ Work Phone No. _____

Address _____

_____

Please enclose required fee made payable to "NORTH JERSEY SECTION IEEE"

Signature _____

## A ONE-DAY IEEE SEMINAR ON
# Grounding, Shielding, and Surge Protection of Microelectronics Equipment Used in Protection, Control, and Instrumentation Systems

**Presented by the IAS and PES Chapters, North Jersey Section**

**Thursday, September 19, 1996, 8:30AM to 3:30PM**

**Jersey Central Power and Light HQ, 300 Madison Ave., Morristown, NJ 07962**

Microelectronics is here to stay in industrial and power generation plants, power distribution networks, commercial/institutional buildings, and transportation systems. Programmable logic controllers, distributed digital control systems, and personal computers are the "brains" of modern control and data collection applications ranging from elevator controllers and fire alarm systems through integrated control networks for entire power plants and manufacturing complexes. Failures of microelectronic equipment due to lightning, power system transients, or noisy communications lines can have serious effects on facility safety and productivity. Designers and users of microelectronics-based control systems need to know about the shielding, bonding, grounding, and surge protection technology that guards against such problems.

This seminar is designed for...
- Consulting electrical engineers
- Power system protection and control engineers
- Process control and systems engineers
- Electrical and instrumentation maintenance technicians

It will provide a comprehensive introduction to grounding, shielding, and surge protection for microelectronics in industrial and commercial applications.

### TOPICS

- **Introduction and overview**
- **Transient overvoltages**
  - Transient sources
  - Electromagnetic coupling
  - Estimating coupled transients
  - Estimating required insulation levels
- **Grounding principles**
  - Safety versus electronic system grounding
  - Neutral grounding
  - Signal reference grounding
- Coupling between safety and electronics grounding during surges
- **Susceptibility of microelectronics to electromagnetic interference**
  - Inductive coupling
  - Capacitive coupling
  - Objectives of EMI shielding
  - EMI shielding techniques
- **Surge protection**
  - Power supply circuits
  - Communications circuits
  - Electronic circuits
- Surge protection devices:
  - Types and application
  - Testing
- **EMI/RFI criteria**
  - Requirements for sensitive equipment
  - Design and test standards
- **IEEE and IEC standards**
  - Surge protection
  - EMI/RFI
  - Electrostatic discharges
- **Questions and answers**

### Seminar Leaders

**Laurie Coyle**, Corporate Account Manager, Transtector System Power Quality Division

**Richard H. McFadden**, P.E., Fellow, IEEE. Chief Electrical Engineer, Advanced Technology Division, Science Applications International Corp.

**Kenneth J. Oexle**, P.E., Senior Member, IEEE. Director of T&D Engineering, Jersey Central Power and Light Company

**R. Vittal Rebbapragada**, P.E., Senior Member, IEEE. Senior Consulting Engineer - Electrical Power Systems, Raytheon Engineers and Constructors

**Cost** - including materials, morning refreshments, and luncheon:

| | |
|---|---|
| IEEE members | $100.00 |
| Non-members | $150.00 |
| Students with valid ID | $50.00 |

Reserve your place by mailing a check payable to **"IEEE North Jersey Section"** to R.H. McFadden, SAIC, 7 West 36th St., New York, NY 10018. Call-in reservations are welcome. **$25.00 DISCOUNT FOR FULL (NON-STUDENT) REGISTRATIONS POSTMARKED BY AUGUST 30!**

For information or registration, call Dick McFadden, 212-239-8510; Vittal Rebbapragada, 201-460-6327; or Ken Oexle. 201-455-8481.