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September 2004

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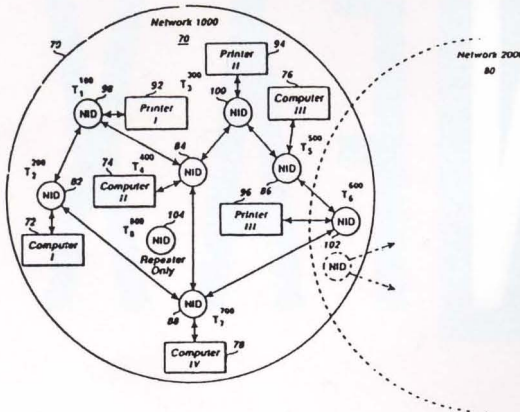


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Institute of Electrical & Electronics Engineers
— Chicago Section —

1894
Was A Good
Year for the
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and Roger Swanberg

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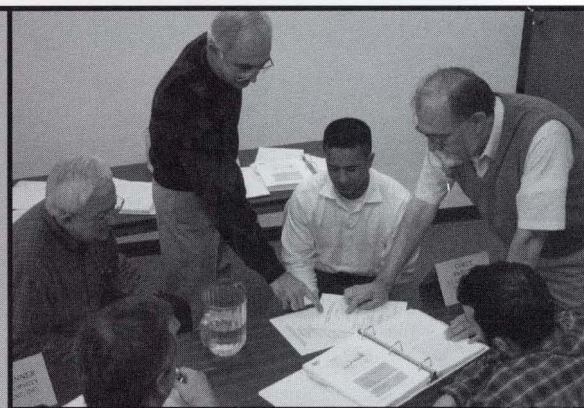
During three days of class before the workshop, students will study EMC design techniques and the calculations required to design a product to meet compliance regulations.

In the Workshop:

Using an example of a real life product and following typical design principles, students will:

1. Develop a block diagram.
2. Determine the product's parameters.
3. Calculate the probable emissions and immunity of the:
 - a. Circuit boards
 - b. Power supply
 - c. I/O lines
 - d. Enclosure
4. Determine if there are EMC concerns.
5. Find cost effective mitigating steps while the product is still on paper.

When you leave this class, you should be ready to lead a design team with a high degree of confidence that your products will meet the EMC requirements.



Special Offer:

Students who have previously taken both D.L.S.'s "Introduction to EMC Design Practices" and "Design Techniques for Controlling Radiated Emissions" will receive a special discount on this workshop.

Seminar/workshop will also be held in April.

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Chicago Section Executive Committee Meeting

Tuesday, September 14, 2004, 7:00 p.m.

DeVry DuPage, Room TBA, 1221 N. Swift Rd., Addison, IL

No Registration Needed

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1894

Was a Good Year for the Chicago Section

By Connie Kelly

What follows is the introduction given on March 23, 2004 by narrator Ron Kollman during the Chicago Section Inaugural Meeting Reenactment held at the McCormick Tribune Campus Center on the Illinois Institute of Technology campus. The Chicago Section holds the distinction of being the first section of the American Institute of Electrical Engineers formed outside of New York having held its first meeting on March 21, 1894 at the new Armour Institute. A reenactment of this first meeting was made by current members of the IEEE Chicago Section.

Ladies and Gentlemen let us welcome you to the year 1894. We have recently dealt with a global financial panic, inaugurated a new president, Grover Cleveland and watched France conquer Viet Nam and establish French Indochina. Coca Cola is now available in bottles. Coxey's Army from Ohio and Kelley's West Coast Army led by Jack London, the first American protest marches, are departing for Washington, DC to protest a severe lack of jobs and hear some complaints by labor in the Pullman Works utopia. In Colorado, women have just received the right to vote. Scientists from

Sweden and America determined that the burning of fossil fuels might cause global warming due to CO².

The Civil War has passed but is still fresh in most adult memories. We in the Midwest had shown the country during this war that there was a vibrant society across the Appalachians and that exciting things could happen outside of the Boston-New York-Washington corridor.

Chicago is fast becoming the center of the Midwest. Ida B. Wells is publishing tracts on the status of the "Colored American" in Chicago. Muckraking is getting its start on the muddy streets of Chicago. Rising out of the muck were the skyscrapers of Burnham and Root and Sullivan and Adler.

Local telephone service is available through the Chicago Telephone Company and some long distance is available through American Telegraph and Telephone. Wires for electricity and telephone crisscross rooftops in Chicago. Thomas Edison still dominates innovations now with the construction of the first motion picture studio in West Orange where the earliest Edison motion pictures were filmed. Edison is still getting patents but other players are entering the "picture."

Chicago's place as a great city was solidified in late '93 by the opening of the Columbian Exposition. The White City glow could be seen for miles attracting return business to the Midway at the foot of Hyde Park. The use of electricity to replace dangerous candles and the only slightly more reliable gas lamps got the attention of the entire country. Edison, of course, had the General Electric display but Westinghouse with Tesla had a grand display as well in the Electrical Building. The Western Electric Company based out of Chicago showed their wares and was already providing wire, phones, electrical equipment and telephone switchboards across the country.

After the Exposition a group of dedicated Chicago-area natives turned their attention to getting the frontier city the technical recognition it deserved. Up to this time the East Coast controlled the technical universe. The Ivy League dominated all innovation and even mid-continent work had to travel to the East Coast for validation. IEEE was no different. All technical papers were presented in New York. The creative engineers and businessmen who had created the "White City" felt that they had earned the right to promote and present their works independent of the East Coast establishment.

Chicago had a number of IEEE members who felt that their numbers, innovations, and determination had earned them the right to hold local meetings. Travel to New York to attend technical presentations was time-consuming and difficult to justify on a frequent timetable. Holding local meetings would validate their work and allow for an easier flow of ideas and information without posing a hardship for the members, their families, and their companies. A group of influential Chicago scholars and businessmen had broached the subject with Institute members who visited the Columbian Exposition. Ralph W. Pope was enlisted to further plead Chicago's case for local meetings at the New York October meeting. Pope's case for sanctioning local meetings was somewhat more prudent than his case for automobiles causing the demise of the housefly. Based on Pope's petition and the growing realization that Chicago was fast gaining prominence and could rightly challenge the authority of New York with the credibility gained from the Columbian Exposition and the pioneering work in electricity and communications being

done by Chicago area members, a protocol for the meetings was published and communicated to the Chicago Group. With the endorsement of their actions, the Chicago group made plans to hold their formal inaugural technical meeting. There were still strict rules designed to make sure that New York controlled the activities, but the camel's nose was under the tent. Knowing that they had to make a quick and commanding impression, the members began to develop a plan to hold the first sanctioned meeting outside of New York City.

On February 20, 1894, Edward Caldwell submitted a petition signed by 21 Chicago area members requesting the authority to hold local meetings. Chicago had already gained a reputation for being a determined and resourceful community. A world-class site and a memorable topic would be needed to insure that this meeting was not an aberration.

Professor Wilbur M. Stine offered the new Armour Institute in Professor Stine's lecture hall to be the first meeting place. The fact that Professor Stine had been on the jury of electrical awards at the Columbian

Exposition gave a level of authority to the groups endeavor. And the school itself was the benefactor of much of the surplus equipment from the fair.

The topic of the paper had to be one that would shake the engineering world. The more controversial the topic is, the better. Edison's realm was at the beginning of collapse. Lawsuits directly led to the failure of the Edison Electric Company to capture and fulfill the lucrative contract with the Columbian Exposition. Edison had proposed lighting the fair with DC devices for a price tag of one million dollars. Westinghouse using Tesla's competitive AC system came in with a bid of under half. Edison tried to block the use of his bulbs with Tesla's system and vice versa but Westinghouse eventually won the contract to light the Columbian Exposition.

The politically aware Chicagoans knew that a challenge to Edison would gain immediately attention not only for his failure to garner the Columbian contract, but also for the ongoing animosity between Tesla and Edison. Nikola Tesla was the Vice-President of the IEEE in New York and a paper chal-

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lenging Edison would have a distinct edge both with the New York committee and the papers of the day.

The paper selected was authored by Professor William A. Anthony, regarded the father of the Cornell University Physics Department. Anthony was a respected physicist, innovator, and recipient of a major prize at the Philadelphia Centennial Exposition in 1876. Professor Anthony was an Easterner and a former president of AIEE whose tie to the Midwest was through his protégé, Professor Dugald C. Jackson. Professor Jackson would present his paper to the Chicago group. Professor Jackson proved an able bridge between the two constituencies because not only had he trained under Professor Anthony he had been on the electrical awards panel at the Columbian Exposition. With the details of the New York requirements satisfied, between 40 and 45 members of the Chicago group met at Professor Stine's lecture hall concurrent with a meeting at the Institute offices in New York.

Before the meeting was called to order, attendees took advantage of the telephon-

ic connection between Chicago and New York, arranged compliments of Mr. Angus S. Hibbard, General Manager of the Chicago Telephone Company. The possibilities of extending the use of the telephone to the pseudo broadcasting arrangement of a multi-party line were not lost on the local entrepreneurs. Mr. Hibbard was planning to broadcast election results from the East Coast to the Midwest for the midterm elections over party lines before the morning papers. A total of 40 receivers were at the disposal of the attendees at this AIEE meeting.

The Anthony paper was long and detailed addressing the objectionable blackening of the Edison bulb over time and the apparent superiority of the Novak Bulb" designed by John Waring of the Waring Electric Company. Rather than degrading the illumination over time, the Novak lamp not only reduced the degree of discoloration but also produced a slight greenish tint rather than the darkening black of the Edison lamp. The Novak lamp was the subject of bitter litigation as Edison sought to maintain his control over the industry by extending his patents.

The paper polarized the audience in both New York and Chicago, sparking comments that lasted well past midnight. Mr. Francis Jackson set up an exhibit of diagrams rebutting the specifics of the paper, having traveled from the General Electric Company's offices in New Jersey for the purpose. Mr. John Howell echoed that view at the New York Meeting.

Professor Stine provided an academic view of the paper.

Professor Jackson answered from New York. The possibility of bringing audiences in direct contact with the author of a technical paper was not lost on either the New York or Chicago members. During the discussion portion of the meeting, AIEE President Huston telephoned the Chicago meeting. Though both the proponents of the Edison lamp and those of the Novak Lamp held firmly to their ideas and appeared not to be influenced by the arguments in the paper, it was determined that this was still a valid exercise and the practice should be continued.

Though neither the Edison bulb nor the Novak bulb are currently produced, and in fact did not survive in that form much past the expiration of the Edison patents in 1894, that first meeting had long ranging consequences. Though Edison's ferocious business practices made him the richer and more highly regarded in his day, it is actually the work of Tesla, which has proven to be the more significant, and his regard is growing.

That first Chicago presentation led to the eventual development of sections around the country. The Chicago Section remains a large multitasking group with active societies in most subspecialties.

The interest sparked in the academic community at Armour Institute led to the establishment of the second ever student chapter, again the first outside of the New York area. Armour Institute itself survives through the merger with Lewis Institute as Illinois Institute of Technology, our host tonight for this historic occasion. That first student chapter outside New York has just celebrated its centenary last month and continues to be an active vital part of the Chicago Section.

This is the meeting that we present to you this evening. ■



Reenactors from the Chicago Section Front row, left to right: Norm Phoenix, Section Vice-Chair, playing the part of Edward Caldwell, Honorary Secretary of the meeting; Constance Kelly, EMB Chapter Chair, script and audiovisual support; Dennis Lamont, Section Secretary, playing Francis E. Jackson, a General Electric executive from Harrison NJ, sent to Chicago by the Edison interests to present a critique of the paper. Back row, left to right: Jim Fancher, Section PACE Chair, playing Angus Smith Hibbard, then General Manager of the Chicago Telephone Co., who arranged for 40 dedicated phone lines to connect with the parallel meeting in New York, and who presided at the meeting after being elected chairman; George Thomas, playing Prof. Dugald Jackson of the University of Wisconsin, who read the paper by Prof. Anthony of Cornell which was the subject of both the Chicago and New York meetings; Ron Kollman, AP/MTT Chapter Chair, narrator, audiovisual preparation, and costume procurement; Prof. James Stine of IIT, playing Prof. Wilbur Stine (no relation) of Armour Institute (now IIT), who furnished the lecture room and facilities for the first meeting, and also commented on the Anthony paper.



Donald Helgeson of Chicagoland Electro-Historical Association presented the Chicago Section an AIEE publication dated 1904 entitled "The Chicago Electrical Handbook."



The reception area of the new MTCC was a perfect venue for pre-dinner mingling



The reenactment was staged in the MTCC auditorium.

Do You Know Your Chicago History?

1. Armour Institute was chartered in 1890.

In what year did classes first begin?

- a. 1890
- b. 1891
- c. 1892
- d. 1893
- e. 1894

2. What was the annual tuition the first year of classes at Armour Institute?

- a. \$60
- b. \$100
- c. \$120
- d. \$150
- e. \$180

3. What US president opened up the World's Columbian Exposition?

- a. James Garfield
- b. Chester Arthur
- c. Benjamin Harrison
- d. Grover Cleveland
- e. William McKinley

4. What Chicago mayor was murdered just days before the Fair's closing ceremony?

- a. William Ogden

b. Monroe Heath

- c. Carter Harrison
- d. John Roche
- e. Anton Cermak

5. Chicago Day at the World's Columbian Exposition was to honor what event?

- a. Louis Jolliet's discovery of the mouth of the Chicago river
- b. Fort Dearborn massacre
- c. Christening of the USS Chicago
- d. Abraham Lincoln's nomination at the Wigwam
- e. The Chicago Fire

6. How many people attended the Fair during Chicago Day?

- a. 64,325
- b. 102,940
- c. 323,111
- d. 579,213
- e. 716,881

7. The Palace of Fine Arts is the only structure of the World's Columbian Exposition that remains. What is the current name of this building?

- a. The Art Institute

b. The Planetarium

- c. The Field Museum
- d. The Museum of Science and Industry
- e. The South Shore Country Club

8. What was the adult admission fee for attending the World's Columbian Exposition?

- a. 5 cents
- b. 10 cents
- c. 25 cents
- d. 50 cents
- e. \$1.00

9. What did it cost to ride the Ferris Wheel?

- a. free
- b. 5 cents
- c. 10 cents
- d. 25 cents
- e. 50 cents

10. How many people could ride the Ferris Wheel at the same time?

- a. 60
- b. 120
- c. 320
- d. 780
- e. 2160

Answers: 1.d 2.a 3.d 4.c 5.e 6.b 7.d 8.d 9.e 10.e

Evening Meeting

Chicago Chapter of the IEEE Power Engineering Society

Wind Generation in Illinois (Coming Soon to a Farm Field Near You)

Wednesday, September 8, 2004

James McNulty

Commonwealth Edison Company

About the Topic:

The presentation will explore the viability of wind generation in Illinois. Specifically, we will discover why developers locate in Illinois, what they look for when they place a wind project, as well as some of the concerns, obstacles, requirements and financial incentives associated with any wind turbine development. We will review newer technologies used to convert wind energy to electrical energy as well as the specific information on a new commercial wind farm recently located in Illinois.

About the Speaker:

James McNulty is a Senior Contract Specialist in the Transmission Operations

and Planning organization at Commonwealth Edison Company in Oak Brook Terrace, Illinois. At ComEd he has worked in various technical and management capacities over the past 17 years. Jim earned his BS degree in Electrical Engineering from the Illinois Institute of Technology and his MBA in Finance from the DePaul University, Charles H. Kellstadt Graduate School of Business.

Location:

ComEd Commercial Center, 1919 Swift Drive, Oak Brook, IL (near the I-290 and I-294 interchange)

Time:

5:30 p.m. Social
6:00 p.m. Dinner
7:00 p.m. Presentation
8:30 p.m. Adjourn

Reservations:

Please call the IEEE Business Office by noon on Monday 6 September 2004 at (312) 253-4333 or (800) 898-IEEE to make your reservation. The cost of the optional box-lunch style dinner is \$15.00 for IEEE members, \$20.00 for non-members, payable at the event. Sorry, we are unable to process credit cards. Checks payable to "IEEE-PES Chicago Chapter" and cash are accepted, and receipts will be provided.

Continuing Education

IEEE technical meetings may be acceptable as continuing education where required for maintenance of professional engineering licensure. Refer to the individual state's requirements for details.

For more information, please visit the Chicago Chapter IEEE PES web site: <http://peschicago.org>

Evening Meeting

IEEE Communication/Computer Society Chicago Chapters
(Joint with IEEE Fox Valley Subsection)

QoS Challenges of Voice in Packet Networks

Tuesday, September 21, 2004

Chris Stegh
Avaya Inc.

About the Topic:

With carriers and enterprises moving quickly from TDM towards packet-based telephony, engineering the IP network for adequate voice quality provides new challenges. The speaker will overview the differences between packet and TDM networks, outline the major impairments of voice in a packet network, provide audio examples of poor voice quality, explain some engineering tradeoffs to minimize impairments, talk about the IETF's Quality of Service options (DiffServ, RSVP), and close with specific challenges of QoS in Intranets and Internet before beginning an open discussion.

About the Speaker:

Chris Stegh is a Senior Systems Engineer with Avaya, who has spent 8 years focused on designs and implementations of IP networks. His EE degree is from Northern Illinois University and his MBA from the University of Iowa. His background with many customer networks and multiple vendors' gear will make this talk more general to the technology, not to a specific hardware implementation.

Location:

IIT Rice Campus, Room 166

Directions:

The IIT Rice campus is on the northeast corner of the junction of East Loop Road at Butterfield Rd. The intersection is about 3 miles west of IL 355 and IL 53

Map:

www.rice.iit.edu/directions.html

Time:

6:30 p.m. Social (Free snack and beverages)
7:00 p.m. Presentation

Sponsorship:

IEEE Communication Society Chicago Chapter, Computer Society Chicago Chapter and IEEE Fox Valley Subsection

Cost:

There is no charge for attending the seminar.

Reservations:

Reservations are not required, but registering your intent of attendance at ieechi@yahoo.com is very appreciated.

For More Information:

Visit IEEE Chicago Section website at: www.ewh.ieee.org/r4/chicago/, or contact: Jack Sherman j.sherman@ieee.org, Yigang Cai ycai@ieee.org, Jerry Kattke g.kattke@ieee.org, or Joe Weesner joe.weesner@ieee.org

Evening Meeting

IEEE – IAS/IES Dinner Presentation

Requirements for Electrical Rooms

Wednesday, September 22, 2004

About the Topic:

This presentation will review different types of electrical rooms and their requirements. Some of the different types of electrical rooms to be discussed will include utility vaults, electrical rooms, generator rooms, and UPS/Battery Rooms. Issues to be covered include fire ratings, clearances, HVAC, fire protection, lighting, and structural concerns.

About the Speaker:

To be announced.

Location and Time:

COSTA'S (GREEKTOWN)
340 S Halsted St., Chicago, Illinois

5:30 p.m. Social
6:00 p.m. Dinner
7:00 p.m. Presentation

Directions:

Costa's is located in Greektown on the corner of Van Buren and Halsted. See www.iaschicago.com for detailed directions and a map.

Cost:

Your cost includes the presentation and a four-course dinner with a choice of the main entry - Roast lamb, Chicken, or Fish. (Vegetarian or special dietary meals available upon request). Cost is \$25 IEEE Member and \$30 non-member. Valet

parking is included with your meal.

Reservations:

Please call the IEEE Business Office at (800) 898-IEEE or (312) 253-4333 with your reservation. Please note any special meal requests at the time of the reservation. You can also make your reservations on line at www.iaschicago.com

Note: For P.E. licenses that require continuing education for renewal, attendance at IEEE Technical Meetings is acceptable as one Professional Development Hour (PDH) per meeting.

Evening Meeting

IEEE Chicago/Rockford Consultants Network

(A Joint Affinity Group of the IEEE Chicago and Rock River Valley Sections)

Fault Tolerant Methodologies

Monday, September 27, 2004

John Poust
Rauland-Borg Corporation

About the Topic:

Fault tolerance is a well-understood need in electronic systems. However, while we make allowances for anticipated imperfections in hardware and software, we often do not make the same allowances for recurring trouble spots in the development process. This presentation will offer some ideas on trouble spots in three areas: post development support for a product, product testing, and project estimation.

The presentation starts with a discussion on ways to gather data to resolve problems with systems once they are in service, including obtaining a call stack back trace, alternatives for collecting diagnostic data, and options for data retrieval. Next, we will discuss test development, test refinement, testing limitations, and test documentation. In the last section we will cover agile methodologies and traditional approaches with a focus on embedded systems and their interfaces. Also, we will discuss some thoughts on managing the

moving target of expectations. The conclusion of the presentation will be a question and answer session where we can share our experiences on these matters.

Members and non-members are invited to both the meeting and the optional dinner. (Reservations are NOT required).

About the Speaker:

John Poust is a Software Engineer with Rauland-Borg Corporation, a maker of hospital and school intercom equipment in Skokie, IL. Mr. Poust has presented papers at the Embedded Systems conference including a paper on Design for Debugging. Mr. Poust has his BSEE from Southern Methodist University and an MBA from Columbia University.

Meeting Location:

Palatine Public Library
700 North Court • Palatine, IL
847-358-1216

Dinner Location:

Bakers Square
270 E. Northwest Hwy. (at the corner of North Court St.), just south of the library

Time:

6:15 p.m. Optional Group Dinner at Bakers Square
(Order off the menu - reservations not required)

7:30 p.m. Meeting - Presentation and Open Discussion

9:15 p.m. Adjourn

Information:

Information about the network can be obtained by e-mail to either consult-net@bmillerengineering.com or JAuerConsulting@worldnet.att.net, or visit our web site at www.drblank.com/coaction.htm

See you on September 27, 2004, and bring consultants and those who aspire to be consultants for a pleasant and informative evening of networking.

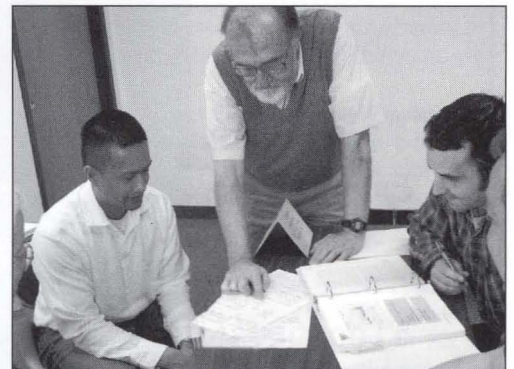
Attendance at this meeting will earn 1.0 PDH.

Meetings are usually held on the last Monday of odd-numbered months.

New Proprietary Computer Programs to Solve the Most Complex EMC Issues

As part of the curriculum in Donald Sweeney and Roger Swanberg's new EMC Practical Applications Seminar/Workshop students will use, and then take home, a copy of the computer program designed by the instructors. It addresses design considerations from component level, through circuit boards, to enclosure level. The seminar/workshop is presented in a practical, hands-on style providing the step-by-step design process to avoid EMC problems. Attendees can then put their acquired knowledge to immediate use in an optional free 45 minute design evaluation of their own product. To register call Carol at 847-537-6400 or email her at corowski@dlsemc.com. For more information click on www.dlsemc.com.

EMC Practical Applications Seminar/Workshop
October 14-15 and 18-19, 2004
Hilton Hotel, Northbrook, IL



Please Help us Establish a New Life Member Chapter for Our Chicago Section!

Are you a Life Fellow, a Life Senior Member, a Life Member, or a Life Associate Member? Then please join me in establishing a local IEEE Life Member Chapter. We hope to have periodic lunch time meetings in various locations in the greater Chicago area that you can reach conveniently. Our meetings will have some technical contents, but we should also try to stress the idea of getting together as professional colleagues. Of course, spouses and friends are invited to attend as welcome guests. If practical, some of our meetings may be joint with our other local Chapters or with our Student Branches.

We would also serve as the Section's essential resource for our local Student Chapters: we are really needed as occasional guest judges for their school-sponsored technical contests. Just look at our Chicago Section Web site (ewh.ieee.org/r4/chicago) under Recent Events in February 2004 for some recent examples - several clever entries will remind you of some famous "Rube Goldberg Projects"! We can also offer our services for the annual Engineers Week events that the Chicago Section sponsors during late February.

If you are interested in forming such a Life Member Chapter please send me an e-mail message at j.feitler@ieee.org, or tell our local IEEE Office at 1-800-898-IEEE (1-800-898-4333). According to IEEE's relevant Web page, we need a list of interested Life Members to start an officially recognized Chicago Chapter. Please be sure to tell me your e-mail address and your preferred telephone number so we can keep in touch with each other in a timesaving manner.

Look forward to hearing from you folks very soon. Then we can get started, arrange for some initial meetings, and later on elect our Chapter Officers. Please note that any Life Associate Member is eligible to serve as a "non-elected" Chapter Officer; any other IEEE Member at a higher Life membership grade can become an "elected" Chapter Officer.)

Sincerely yours,
Joe Feitler • j.feitler@ieee.org
Life Senior Member

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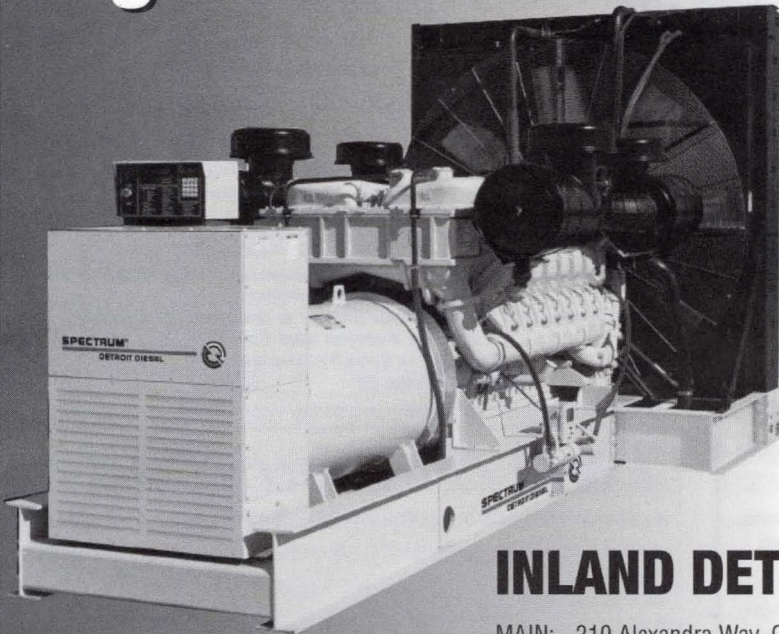
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