IEEE

OCEANIC ENGINEERING SOCIETY

Newsletter

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IEEE OCEANIC ENGINEERING SOCIETY

CHAPTER CHAIRMEN

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Message from the Vice President, Professional Activities

Norman D. Miller

OES - Back to the Future

Every five years each Technical Society in IEEE is reviewed by the Technical Activities Board. The Oceanic Engineering Society was reviewed by TAB in February 1999 for the period of 1993 through 1997. In preparing for this review, President Claude Brancart had a full day meeting of the Executive Committee in Washington D.C. in December 1998. All of the operations of the society were discussed and reviewed. The one general conclusion drawn from the review was that while we are one of the smallest of the societies within IEEE , we were also one of the most active of the societies.

It is well to reflect on the past briefly so see where this may point us for the future. The Society's strengths are its Conferences and it Publications. During the review period we held five OCEANS conferences. Two were in Canada, O93 and O97, one was in France, O94, and two were joint conferences with the Marine Technology Society in San Diego, O95 and Fort Lauderdale O96. All of the Conferences were well attended and were highly successful. During this period we also held three workshops. We held AUV workshops in 1994 at Cambridge, MA and one in 1996 at Monterey, CA. We also held a Current Measurements workshop at St. Petersburg, FL in 1995. During this period we also participated in five Offshore Technology Conferences in Houston, TX It should also be noted that we reunited with the Marine Technology Society in jointly sponsoring the OCEANS Conferences in the USA and Canada.

Our publications greatly improved and expanded during this five year period. The Journal of Oceanic Engineering prospered under the guidance of Dr. William Carey and became a sought after journal for the latest information in Oceanic Engineering technology. The OES Newsletter continued to improve and provide timely information on society activities and news of forthcoming conferences and events as well as provide reports on the conferences and workshops sponsored by the Society. Plans were also made to put the OES Newsletter on the OES web page. This was accomplished in 1998. During this same time period the Society developed a web page and is a part of the whole IEEE internet news program.

During this review period the Society was also successful in starting three new chapters outside of the USA. The French Chapter was formed in 1993 and helped to organize and host OCEANS 94 in Brest, France. A chapter was formed in Trondheim, Norway in 1994 and another chapter was formed in Tokyo in 1997. The French chapter was also responsible for organizing and hosting OCEANS 98. The Tokyo chapter organized and hosted Underwater Technology 1998 and is preparing to host UT 2000 also.

Like many organizations our membership took a dip beginning with the cutback in Defense spending and the resultant loss of oceans related employment. During this time we did see an increase in members from areas outside of the USA, notably France, Norway, and Japan. The membership decline has reversed and we are beginning to see an increase in membership. From an activity and a financial point of view the Society is strong and a viable part of the IEEE. However as we look to the future there are areas that we need to concentrate on. Specifically membership and chapters. We need to continue to recruit new members and particularly younger members who can gain much from being part of a technical society. We also need to gain members for those who attend our conferences, but are not members of either technical society. This is fertile ground and we are trying different financial incentives to convert these non- members to membership. We also need to gain more student members and plans are in progress to establish student chapters at schools that have supported out Student Poster Programs at the OCEANS conference. We also need to get out present members to upgrade their memberships when they are eligible to advance to the next higher grade. This is of particular importance in enhancing our professional status and getting members to be aware of the value of Senior Membership in a Technical Society.

Another concern for the future is Chapters. Do we need them? While we have added three new chapters in regions outside of the USA we have actually lost a similar number of chapters within the USA. A meeting was held at OCEANS 98 with Chapter Chairs to discuss the future of chapters and if there was a need for them. The general consensus was that chapters did not provoke much interest in the USA. Members have enough outside activities without having to attend OES chapter functions. Those chapters that were active in the USA general hold meetings with the local MTS sections and are semiviable entities. It was also agreed that if a Chapter had an ongoing activity such as hosting a conference, then interest was there to maintain the chapter. Similarly where chapters were associated with the academic community, such as those in Trondheim and Tokyo, there was more interest as a venue for presentation of technical papers and hearing technical speakers. Running a chapter is hard work and requires dedication on the part of the officers to develop programs and maintain

interest in the chapter. Are chapter necessary? You be the judge. There has to be a desire on the members to keep and maintain a chapter. These means membership participation. Passive members don't make viable chapters.

So what is the future for the Oceanic Engineering Society? I think it is very good. We fill a niche in IEEE and provide forums for information transfer through our publications, conferences and workshops. We provide opportunities for students to get introduced to technical societies and find out the values of professional associations. We will grow as we become more involved in the environment and the challenges the 2 1 st century will bring. We do need membership participation and most especially membership feedback. Please send comments, suggestions, criticisms to any of the officers. We are anxious for member feedback so that we can direct the Society in the way that you would like to see it go.

Norman D. Miller, P.E.
Vice President,
Professional Activities

Ocean Sensor Trends

In order to model and thereby manage any complex system, we must understand its variables and how they interact. Prior to this decade, oceanographic environmental measurements were too sparse for the needs of numerical modeling, so that the evaluation of processes and acquisition of meaningful model results was difficult if not impossible. For decades the cry has been, "We need more data and we need it faster, better and cheaper". As we approach the millennium we are converging on instruments that provide just that. This is a result of a combination of factors such as, the development of real-time data transmission techniques, increased power storage, built in calibration software, greatly improved computer processing speeds, high density data storage mediums, and component miniaturization. Instruments are being produced with the ability to measure, process, and store or transmit more data than most numerical models can accept. Higher accuracy data obtained in this decade is leading to improved understanding of climatology models. There are several large scale, directed, coordinated, international, open ocean programs to deploy sensors, collect the data, and refine predictive models. Responsibility for our coastal areas is however divided among many agencies with resources applied in a fragmented ad hoc basis. Our congress would do well to heed the study provided by The Steering Group, Joint Year of the Ocean Project, Our Ocean Future: "Themes and Issues Concerning the Nation's Stake in the Oceans." (See article, "Our Ocean Future: Where to Next?", Sea Technology Oct 1998. pp59-63).

Why More Data?

The coastal environment is important to both civilian and military operations. Coastal activities such as shipping, fishing, recreation, construction, and pollution are significant in the civilian world. The environmental information that each client requires is however, pretty much the same. The oceans contain energy and mineral resources that are becoming more consequential as world demand increases. The U.S. outer continental shelf contains more than half of the nation's undiscovered oil and gas reserves. To recover them, we will need to construct safe, non-polluting structures in very hostile environments. Commercially exploited fishes, protected marine mammals and turtles, and dying coastal ecosystems (specifically coral reefs) all indicate that these resources and their benefits are threatened by human activities. We must have a better understanding of all these processes to properly manage them. At this point, there is not adequate data taken over sufficient time periods to allow dynamic modeling of small scale coastal regions in other than a very rudimentary fashion.

With regard to the military's interest, the Navy's stated goal is to allow it to safely maneuver from the sea to the land under a broad spectrum of environmental conditions. Our more sophisticated military offensive systems need environmental conditions at the target site for optimum weapons load and utilization. Defensive sites or ships require periodic updates on distant atmospheric conditions in order to optimize radar detection of potential threats. Submarines operating in shallow coastal regimes are near impossible to detect without adequate knowledge of environmental conditions. Much of the data collected by the Navy can also be applied to civilian interests.

How Do We Get It?

Initially, the only way to collect oceanographic data was by being there. This requires having large, expensive, labor intensive platforms on site to calibrate, deploy, operate, and recover instruments. Some of our open ocean data must still be collected in this mode. However, we do not have sufficient resources to project this technique into the highly variable littoral environment. Time and space correlation lengths of coastal environmental parameters are small. This also applies to satellites which can provide large scale estimates of various ocean surface phenomena. They cannot provide real-time, small scale data in a highly variable 3D environment. Thus, in order to discern patterns, data must be collected in-situ expansively and often.

We do have sensors with the ability to measure the parameters necessary to accomplish most of our tasks; we need them to be smaller, lighter, cheaper, and have a longer life. Are there any new sensor technologies on the horizon? The major oceanographic funding agencies seem generally satisfied with existing sensors; there is little government support for basic research in this field. So we must expand upon what we have. First,

the existing sensor with its power source and its data collection, processing, storage and transmitting components becomes the instrument. Then, by taking man out of the loop, the instrument must become part of a system. We are nearing the time when we can ask the instrument or system to deploy itself, collect, calibrate, and transmit data from multiple sensors based on some memorized intelligence directly to the user, and go to sleep until it is needed again. How can we accomplish this?

By Expendables.

Following the lead of the naval air anti-submarine warfare community, oceanographers began packaging expendable sensors in air deployable "A" sized cylinders (36" length and about 4" dia.) . Called sonobuoys, they can be ejected from most military and civilian P-3 aircraft. At first, they were used just to quickly profile various oceanographic parameters with comparatively low accuracy sensors. The resulting real-time data is then radioed directly to the dispensing aircraft. Now longer time series (months) data can be collected and transmitted via Argos in real-time using new more accurate sensors in the same size canister. Continuing the miniaturization trend, this year, the Navy begins testing a very small, rugged, air expendable, miniature dropsonde to collect and transmit atmospheric data in real-time. It measures temperature, relative humidity, barometric pressure and 3-D GPS position from a cylinder about 1.5" dia. and 6" long!

The instrument is sized to fit standard countermeasure dispensers (CMD) found on all military and some civilian aircraft. The latest design military CMDs consist of a programmer, a sequencer, and a dispenser block or magazine. Because CMDs have several inter-changeable magazine form factors, other shapes are being used to house and test several other types of oceanographic sensors. One CMD can hold up to 30 rounds, be they dropsondes or other sensors with the same shape and size. The mil-spec. CMDs are relatively big, heavy and expensive. However, because the sensors and the magazines are so small and light, a recent redesign of the programmer and sequencer make it possible to deploy sensors from unmanned vehicles. The ejection of miniature dropsondes, which provide vertical profiles of the atmosphere, has been demonstrated from both the US Navy's "Pioneer" and the US Air Force's "Predator" unmanned aerial vehicles. Deployment of ocean profiling temperature or optical expendable sensors from unmanned underwater vehicles is just around the corner.

By Buoys.

Organizations such as the Woods Hole Oceanographic Institution have long been developing and testing improved moored, instrumented buoys. The buoys include capability for a full suite of meteorological sensors (wind speed and direction resolved to vector averaged winds, atmospheric temperature, relative humidity and pressure, long and short wave radiation, photosynthetically active radiation, and incoming spectral irradiance) and/or full suites of oceanographic sensors (temperature, salinity, current vectors, and various measurements of optical, chemical and biological properties) . The use of the new low altitude earth orbiting satellites (LEOs) will allow the possibility of increasing the data throughput from remote platforms by many orders of magnitude over the currently used Argos or GOES systems. In addition, communication links will allow commands to be sent to the buoy for failure recovery or dynamic response to unexpected phenomena. The buoys will provide extended real-time data less expensively than manned platforms. Great for the deep open ocean, but both man and nature play havoc with floating structures in the coastal environment. Here we need a buoy that would normally rest on the ocean bottom, monitoring the environment, including waves, tides, and currents. It should rise on some predetermined schedule, profiling the water column as it rises, quickly transmit its stored data, and return to the bottom. Its nested profile should allow fishing nets to slide over and it should have the intelligence not to ascend if boats or potentially damaging storms are near.

By UUVs and UAVs.

Unmanned oceanographic vehicles tethered by cables (Remotely Operated Vehicles) can take us into the Titanic, inspect ocean bottom features and structures, and handle underwater explosives. But the tether is obviously a limiting factor. It provides power and allows two way data transmission; two major limitations to the truly autonomous unmanned underwater vehicle (UUV). High data rate underwater communications are limited by distance and subject to background noise. Even more restrictive are the great limitations on energy storage. Both of these problems are being addressed by the US Navy and the academic community in general. However, until there are some major scientific breakthroughs, the need to recover internally recorded data and recharge batteries make UUV data collection a labor intensive approach. We are looking forward to the day when UUVs can become part of a sensor system.

Unmanned aerial vehicles (UAV) have already demonstrated a capability for atmospheric research. Both NASA and DOE have funded development of heavily instrumented unmanned aircraft for high altitude scientific research. Typically they have a wing span of 50 feet or larger to carry several hundred pounds of instrumentation. As mentioned previously, the US Navy, with much smaller vehicles, has funded the development of a payload for the Pioneer UAV. An ability to collect both horizontal atmospheric data with on board sensors and vertical profiles of that same atmospheric space with miniature expendable sensors has already been demonstrated. The expendable instrument data is telemetered back to the UAV, collected on the vehicle and together with the onboard sensors, retransmitted to the ground station for dissemination.

By a Slight Change of Priorities.

We know that there are many government organizations, such as the US Army, US Navy, US Marine Corps, US Coast Guard, , National Aeronautics and Space Administration, National Oceanographic and Atmospheric

Agency, National Marine Fisheries Service, US Fish and Wildlife Service, National Data Buoy Center, US Geological Survey, etc., each funding the development of specialized oceanographic and atmospheric instrumentation and the collection of coastal environmental data for their own purposes. Most of the resulting data is forwarded (hopefully) to established data bases like the one at the Naval Oceanographic Office. (Most data collected in private enterprise tends to remain proprietary.) But should the collection of data, to build data bases in order to support the development of predictive models, remain our first priority? Not necessarily.

All the new instrument developments make it possible to reprioritize the present approach. Reams of data must be collected on individual phenomena in order to build sufficient knowledge to be able to assess its condition in areas where there are no measurement tools and to predict its future behavior with some degree of certainty. The resulting model can then be used to appraise any impact on human operations. So the information provided is an estimate of conditions from science based models to interested parties. Data flows from site to data base to model to user. Given new emplacement techniques, sensor miniaturization, and communication breakthroughs, instruments can be quickly deployed to areas of interest with real time data flow. Thus, the first priority for the real-time data can be a direct path to the user. Secondly, because it is real time data, it is extremely valuable for accurate spin up of near term (days) predictive models. Finally, as the last priority, it can be incorporated into the data bases.

Some "real-time data to user" networks are in effect now. A simple example of this approach is used by surfers in the state of California.. A few years ago, surfers established a dedicated web site displaying the required real-time surf information from instruments on site at each beach. Thus, instead of driving from site to site for the best beach, they could select the surf of the day on a computer. In a more comprehensive example, a Norwegian firm (OCEANOR) has established a line of moored instrumented buoys in deep waters off the coast of Norway. The resulting continuous real-time oceanographic and atmospheric data supplies information needed; to provide very accurate weather forecasts; to predict the drift direction of oil spills in order to protect the salmon nurseries; and to monitor very cold water intrusions to vary salmon feeding schedules and control submerged pipeline oil viscosity.

What's Left To Do?

This discussion has been based on a review of the last several years of instrument development papers presented at the IEEE/MTS Oceans conferences, slanted slightly by my personal experience in the field. Based on that, and the fact that there is always room for improvement I would like to make several unsolicited suggestions and comments.

1. Many of the sensors needed already exist, and we have the rapid, high volume storage and communication techniques required to disseminate the resultant data. We need to continue the integration.

2. Ensure the universities a level of basic research dollars for investigation of new measurement techniques.

3. Develop more innovative approaches for getting those sensors in place where we need them and keeping them alive there.

4. The multitude of government agencies that support various oceanographic endeavors should collaborate to establish priorities, agree on some common goals, and support multi-agency field efforts.

5. Investigate littoral classification schemes in which data from densely instrumented, easily accessible local coastal sites could be extrapolated to less accessible locations with similar characteristics by making only a few basic measurements at that site.

Kenneth M. Ferer received the B.Sc. (honors) in Ocean Sciences at The George Washington University, Washington , DC and the M.Sc. in Management from the University of Southern Mississippi, Hattiesburg, MS.

He began work as an oceanographic technician in 1964 for the US Naval Research Laboratory's (NRL) Deep Ocean Search Branch. He was involved in the initiation, design, and development of deep ocean sensors and methods to conduct the successful searches for the lost US submarines, lost French submarines, and surveys of other deep ocean sites. From there he held various positions in the Naval Oceanographic Research and Development Activity, the Naval Oceanographic and Atmospheric Research Laboratory, and finally back to NRL His work included development of instruments and measurement techniques in support of Non-Acoustic Anti-Submarine Warfare (NAASW). Mr. Ferer retired in 1997 from his position in the government as Acquisition Program Manager for the Oceanographer of the Navy's Ocean Instrument Development Program. He is presently employed by the Air Services Division of Neptune Sciences Inc. developing systems to allow the Navy's unmanned aerial and underwater vehicles to deploy miniature expendable sensors.

Mr. Ferer is currently a member of several professional societies including IEEE, MTS and AOC.

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Who's Who in the OES

James F. Lynch (M 96) was born in Jersey City, N.J. on June 3, 1950. Coming from a family which was traditionally tied to the sea, he endeavored to change that tradition by choosing the route of Physics and Astronomy studies. He received his B.S. in Physics magna cum laude from the Stevens Institute of Technology in 1972 and the Ph.D. in Nuclear Physics from the University of Texas at Austin in 1978. However, during his graduate studies, he worked part-time in a laboratory doing ocean acoustics studies, and the ocean soon claimed its own. From 1978-1981, he worked at the Applied Research Laboratories of the University of Texas at Austin doing underwater sound propagation and sonar research. Looking to move back to the Northeast to be closer to family, his wife Christine found an advertisement in Physics Today about a staff opening at a place called "Woods Hole Oceanographic Institution." Applying there, and wooed unfairly by what Ocean Engineering Department chairman Earl Hays jokingly called "soft cider," he accepted a position on the scientific staff in

James F. Lynch

1982, and has been there ever since. He is currently a Senior Scientist in the Applied Ocean Physics and Engineering Department. His specialty is ocean acoustics, with an emphasis on "acoustical oceanography," i.e. using sound as a remote sensing tool to determine ocean properties. He is a Fellow of the Acoustical Society of America, and chairman of its Acoustical Oceanography technical committee. He recently became the Editor of IEEE JOE, which promises to be one of the biggest challenges of his career.

Dr. Lynch's career highlights have not just been academic, though he considers himself very lucky to be "back in the family business" via academic studies of the ocean. Among his favorite "personal career highlights" are playing city league softball against the University of Texas football team (who were luckily better at football than softball), going to sea with some of the craziest and most competent oceanographers in the world (though "crazy" might be redundant in describing oceanographers), and being able to relieve stress via piano playing, karate, and computer gaming. He is married to a wonderful lady, Christine M. Lynch, with whom he is writing a book, and has two lovely daughters, Kerry and Holly, who's ambition is to spend far, far more money than their father makes.

Dr. Lynch considers it a great privelege to follow Dr. William Carey as Editor of IEEE JOE, which has improved as a journal steadily through the years. He hopes that he can help the Journal expand into the multimedia and online worlds, and to keep the quality and excitement factors of the Journal as high as they have been in the past.

CALL FOR MANUSCRIPTS

Solicitation Of Manuscripts For IEEE Potentials Magazine

The *IEEE Potentials Magazine* is soliciting manuscripts for.all aspects of electrical/electronic/computer engineering.and computer science

The *IEEE Potentials Magazine* goes to all student members of the ieee (usa and canada), presently about 45,000.

The level of the article is addressed to the undergraduate student and has several objectives : interesting the student in a topic for further study, explaining technological advances in an area, a forum for technical ideas, articles of interest technically.

It should be stressed that the article should not try to mystify the student but to enable the student to learn more about technical material that he/she may/may not become acquainted with in their formal course work.

Length of article can be no more than 10 manuscript pages (8 1/2-11) reduced by number of figures- shorter papers also acceptable

The manuscripts are reviewed by: students, faculty, researchers in area and then a decision is made as to whether to publish or not.

If interested, contact:

Dr. George W. Zobrist
Editor, IEEE Potentials Magazine
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Most Innovative New Product Award/Software Category

Dan Alspach and Michael Chaffin are pleased to annouce that ORINCON Technologies, Inc. has been named the winner of the "Most Innovative New Product of 1998" Award in the software category by UCSD's CONNECT in Technology and Entrepreneurship at a luncheon held today at the Hyatt Regency La Jolla.

Most of the work on this product development was done in Don Owen's Civil and Commerical Business Unit. Congratulations to Don and his team - Jon Petrescu, Milan Plavsich, Ellen Frangione and Tim Zadra. A key enabler in this product was the IVS 2000A [Intelligent Vehicle Sensor] developed by an earlier team lead by Don Owen. Congratulations to Don and his team - Dale Klamer, Akhelish Maewal and Milan Plavsich. GSTARS (ACATS) has been licensed to ARINC who is proceeding to sell them agressively. An ARINC Representative, Michael Woiwode, was present for this celebration.

More than one thousand of San Diego's entrepreneurial leaders were in attendance when Dr. Alspach received the award on behalf of ORINCON Technologies and ORINCON Corporation.

This award is more validation of the potential success ORINCON Technologies expects from technologies developed internally. ASW technology used in ocean rearch was translated to this airport ground safty problem.

Daniel Alspach,
President ORINCON Corp.

CONGRATULATIONS TO ALL INVOLVED.

UPCOMING CONFERENCES

The 1999 Large Engineering Systems Conference on Electrical & Computer Engineering "LESCOECE '99"

The Halifax World Trade Convention Center
Halifax, Nova Scotia, Canada

June 20-22, l999

Dr. Ferial El-Hawary, P. Eng., F.EIC, F.MTS
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Ultrasonics International '99
joint with **Technical University of Denmark**

Copenhagen, Denmark

June 29 - July 1, 1999

1999 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM '99)

August 23-25, l999

Victoria, B.C., Canada

Second International Conference

Shallow Water Fisheries Sonar
Seattle, Washington

September 7-9, l999

OCEANS '99 MTS/IEEE Conference & Exhibition

September 13-16, l999

Seattle, Washington

Underwater Technology 2000 UT '00

The New Sanno Hotel Tokyo, Japan

May 23-26, 2000

5TH European Conference on Underwater Acoustics ESCPE

Lyon, France

July 10-13, 2000

OCEANS 2000 MTS/IEEE Conference & Exhibition

Providence, Rhode Island
September 11-14, 2000

Oceanology International 99 Pacific Rim Exhibition & Conference

World Trade Centre, Singapore

27-29 April 1999

Contact: Versha Carter - Spearhead Exhibitions Ltd,
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CALL FOR PAPERS

IASTED SIP '99 Int'l Conf. on Signal and Image Processing, October 18-21, Nassau, Bahamas. Submit three (3) copies of Papers by April 1, 1999. Contact Professor Nader M. Namazi, Conference Chair, Attn: SIP '99, Department of Electrical Engineering and Computer Science, The Catholic University of America, Washington, DC 20064 USA.

Calendar

October 18-21 : SIP '99 IASTED Int'l Conf. on Signal and Image Processing,
Nassau, Bahamas.
Contact IASTED Secretariat SIP '99,
1811 West Katella Avenue,
Suite 101,
Anaheim, CA 92804 USA;
iasted@iasted.com;
http://www.iasted.com.

New IEEE Video Series Captures Engineering As Profession

PISCATAWAY, NJ, 15 March 1999 - Now available from the IEEE is the Engineering Profession Videotape Series, Volume II. Included in this volume are the six lectures that were recently given at North Carolina State University as part of the school's engineering graduate program. The six-videotape series seeks to prepare graduating seniors and recent graduates for entering new careers in industry and government. The following topics are presented:

- Engineering Ethics
- Maintaining Professional Vitality
- Employee Benefit Options
- Safety Engineering
- Managing Investments & Financial Planning
- Intellectual Property Protection

The series also includes a PC disk containing abstracts and authors' biographies, and PowerPoint presentation notes. 1999/6 hrs./6 VHS Tapes IEEE order numbers: NTSC - EV5533-QVE; PAL - EV5534-QVE IEEE List Price: $155.00; IEEE Member price: $125.00

Volume I of the Engineering Profession Videotape Series is also available for purchase from the IEEE.

Order from the IEEE Customer Service Department, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331, USA.

For single sales, call 1-800-678-IEEE (1-732-981-0060 outside the USA and Canada); for company or institutional sales, call 1-800-701-IEEE; or fax 732-981-9667. Shipping and handling charges apply. E-mail: customer-service@ieee.org

New IEEE-USA Resume Referral Service Engineers the Right Match

WASHINGTON, Feb. 10, 1999 ð High-tech professionals have a new tool for career advancement: the IEEE-USA Resume Referral Service. And like its popular cousin, the IEEE-USA Job Listing Service <http://www.ieeeusa.org/jobs.html>, the service is free to U.S. IEEE members.

"Over the past few years, we've developed the nation's premier job-posting service for technical professionals; it was a natural next step to introduce a top-of-the line resume database for our members," said IEEE-USA Employment Assistance Committee Chair Gary Johnson. "With industry claiming a lack of skilled high-tech workers, we expect the database to become very quickly a hot property for employers seeking access to the IEEE's rich talent pool. "

The IEEE-USA Resume Referral Service is administered by Resume-Link, the largest publisher and distributor of resume databases in the world. IEEE members who enroll remain in the database for one year with option to renew. Every six months, they will be asked to update their information, or, if they choose, to remove their information from the database. The confidentiality option allows members to exclude specific companies from reviewing their information. Companies who are interested in a member's resume credentials will contact the member to further discuss possible opportunities.

U.S. IEEE members can enroll via the Web at URL http://www.ieeeusa.org /EMPLOYMENT/resume.html or by hard-copy form. To request a form, or for more information, interested members can contact Resume-Link at 614-923-0608 or socmember@resume-link.com.

Employers who seek skilled technical professionals should contact Resume-Link's Dave Meagher at 614-923-0600, ext. 329, or dmeagher@resume-link.com, for access to the IEEE-USA resume database.

IEEE-USA promotes the careers and public-policy interests of the nearly 225,000 U.S. members of The Institute of Electrical and Electronics Engineers Inc., the world's largest technical professional society.

SPREAD THE WORD

The Half-Year Dues Payment Period has begun...and itðs a great time to recruit! Beginning 1 March and extending through 15 August, all new applicants to IEEE and its Societies can join for half of the full annual dues rates. This an ideal opportunity to encourage IEEE membership, as new applicants will receive service throughout 1999 at reduced rates. You may want to consider displaying applications for guests at your next Section meeting if it is not already being done.

In addition, IEEE Society membership and the Societiesð optional publications are half price. If you are a renewed IEEE Member who has been considering trying a new Society membership, what better time than when lower rates are available?

Potential IEEE and Society members can go to the IEEE home page at www.ieee.org and select the link for IEEE Membership for information and an interactive application. If the Web site is not available to you, contact IEEE Member Services Department.

Y2K TRAVEL WOES

In anticipation of the millennium, some larger companies are putting a travel embargo into effect for the latter part of this year and early next year. This could significantly impact registration numbers for meetings and conferences that are scheduled to occur during the period beginning around 9 September 1999 and ending some time in March of 2000.

Please advise your meeting and conference organizers of the potential for reduced participation as a result of the Y2K travel embargoes that may be imposed during the above period. For additional information contact Ken Maze - IEEE Controller's Office.

Y2K COUNTDOWN

The last day of December 1999 and the first day of January 2000 are probably the most important dates in the Y2K computer problem equation, but are you aware of the other dates that require attention in the Y2K test lab as well? They are:

- 3 January: The first business day of 2000.
- 28 and 29 February and 1 March: The days surrounding the leap-year date.
- 31 October: The first two-digit day and month of 2000.
- 1 January 2001: The first day of the 21st century (the true first day of the third millennium).

The first critical day before all of these is 9 September 1999 (9-9-99). In the early days of computer programming, a sequence of 9s was often used to signal the end line of a program. It is possible that some computer systems may recognize this number as an "end" code rather than a date, and end the program.

Like most Y2K problems, the extent of this date problem is unknown. As a result, the IEEE is doing extensive testing before 9 September. There are less than 350 days remaining to 2000. Are you ready? **Be Prepared... Be Compliant.**

ELECTED ADMINISTRATIVE COMMITTEE

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(see Chapter Chair)

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