IEEE
OCEANIC ENGINEERING SOCIETY
NEWSLETTER

EDITOR: HAROLD A. SABBAGH SEPTEMBER 1983 (USPS 420-910)

President's Comments

Now that we are a Society within the IEEE scheme of things, what does that mean? It means that we can have and do several things that we could not as a Council.

First, we can have *members.* This sounds strange; didn't we have members before? No, not in a formal sense. We had people who subscribed to our Journal and Newsletter and who participated in our Conferences. But their primary affiliation within IEEE was to the IEEE societies which sponsored the Council. But now, as the Oceanic Engineering Society, we can have our own members.

Second, we can have *local chapters.* Our members can organize on the local level and be professionally stimulated by meeting and getting to know their professional peers and have speakers and discussions on topics of common interest. Initial activity is underway to start OES chapters in New England, San Diego, San Francisco, Seattle and Washington, D.C. If you reside in one of these areas we welcome your active participation. If you live in another area and would like to see a chapter there, please contact me or Mr. Arthur Westneat, our Chapters Coordinator.

Third, we can have *technology committees.* Our members can organize along technology lines. Those with interest in a certain technology and its application to the ocean environment, can get together in a formal way. You can help organize technical sessions at the OCEANS and Offshore Technology Conferences and even sponsor other, special workshops and symposia. Our Current Measurements Technology Committee has been operating very successfully for several years. Their IEEE Second Working Conference on Current Measurements has made significant contributions to the awareness and advance of current measurements technology and their forthcoming Acoustic Current Profiling Symposium is expected to do the same. Other technology committees similar to this one are needed and we hope to form them. Many areas are currently under consideration. If you would like to see a committee formed in a technology area of interest to you, please let me or Dr. Joseph Vadus know.

Fourth, we can *better recognize and honor significant contributors* within the oceanic engineering community. As a Council we have recognized significant contributors through two awards: the Distinguished Service Award and the Distinguished Technical Contribution Award. As a Society, we can, in addition, sponsor the award of Fellow of the IEEE. This we are in the process of doing, but could not at this year's OCEANS Conference because of the need to "get in synch" with the IEEE review/approval cycle. If you know of those who should be recognized in these ways, contact me or Professor Donald Bolle, our Awards and Recognition Chairman.

That, basically, is what it means to now be a Society. However, it does not end there. The above attributes and activities have potential for further enhancing our service to the oceanic engineering community. The *OCEANS Conferences,* which move from city to city each year, can be improved by the involvement of a local OES Chapter. When a geographic site is selected for a future Conference, there must, of course, be local people to organize and direct the planning. While a local IEEE Section might wholeheartedly endorse the OCEANS Conference in their area, when they seek local people interested and professionally active in oceanic engineering, they often have difficulty. This problem, being due to the diverse nature of the IEEE and its membership, can be greatly reduced by the existence and commitment of a local OES chapter.

The *Offshore Technology Conference,* as well as the OCEANS Conference, can be enhanced by the involvement of technology committees. The committees can assist in organizing sessions in their areas of specialty.

The *Journal of Oceanic Engineering (JOE)* and the *OES Newsletter,* our two regular publications, can be expanded and improved by the involvement of the technology committees. We are increasing the number of special issues of JOE. You have already seen the excellent July special issue on "Tracking and Localization". Other issues on selected topics will be appearing in the future, including: Atlantic Remote Sensing Land Ocean Experiment (ARSLOE), Ocean Seismic Exploration, Simulation Modeling, Extremely Low Frequency (ELF) Communications, Acoustic Telemetry and Instrumentation Development for High Level Nuclear Waste Disposal Beneath the

Continued on page 4

OCEANIC ENGINEERING SOCIETY

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ELECTION '83

Statement by Hans C. Cherney
Candidate for President-Elect

Over the last decade the membership of the Institute has increased by 40%. Our technical activities, our conferences and publications have grown at a similar pace. These changes have brought benefits to many members. At the same time they impose great responsibilities on the IEEE leadership to ensure that the members in fact obtain what they need from a large and complex organization.

In my two years as Regional Director I visited all Sections in the Region using the resources of the Institute to meet the demands of the members. As Vice President of Regional Activities I continued the pattern world-wide of bringing Institute means to bear selectively on Region and Section opportunities and problems. In addition, as a member of the Board of Directors for three years and as a member of the IEEE Executive Committee I participated in decisions affecting the Institute as a whole and acquired an intimate knowledge of the way the IEEE operates. With the changes in technologies, the demands on our profession are changing at a rapid pace. Quality assurance, productivity and manufacturability have joined R&D as areas of importance in determining the future of our industries and profession. The IEEE must assist its members to grow with these changes, indeed to stay ahead of them.

As President I would use my extensive experience as a volunteer IEEE leader to make the Institute responsive to the members' interests and needs whether these concern our technical societies, goegraphical entities or professional activities.

Rebuttal

I stand by my original statement. IEEE resources must be directed to benefit the individual members in meeting and advancing their professional aspirations. To provide the leadership necesssary to do this, the President must at least have these qualifications:

- Extensive experience in volunteer service within the IEEE.
- Awareness of member concerns and needs obtained through personal contact with individual members and volunteer leaders in the United States and outside the United States.
- Intimate knowledge of IEEE organizational structure and decision-making processes and demonstrated effectiveness in their use.

I have these qualifications and I ask for the opportunity to serve you.

Biosketch

Mr. Cherney received the B.S. and M.B.A. degrees from New York University in 1954 and 1966, respectively. He recently retired from IBM Corporation where he had worked for some 25 years in various product and technical planning and personnel functions, both managerial and staff. From 1971-73 he was a member of the Engineering Manpower Policy Committee of the National Academy of Engineering. He contributed substantially to its report, parts of which were incorporated into the Science and Technology Act of 1976. He served on the Planning Committee on Human Resources of the National Research Council and on the 1976 Manpower Conference of the Engineering Foundation. He was chosen as a participant in the 1976 American Assembly on Full Employment Goals for the Nation. He has devoted much of his time and effort to creating a professional environment for engineers. Since 1968 he has been a member of the Engineering Manpower Commission of the AAES (previously EJC). He is also a member of the AAAS, the ASEE, the Federation of American Scientists and The New York Academy of Science.

IEEE Activities (M'74-SM'76) OFFICES: Board of Directors, 1980-82; Region 1 Director, 1980-81; Vice President—Regional Activities, 1982. COMMITTEES/BOARDS: IEEE Executive, 1982, IEEE Employee, 1981-82; Joint EAB/USAB Career Development Committee, Co-Chairman, 1977-78; Long Range Planning, 1981-82; Public Relations, 1981; Regional Activities Board, 1980-82, Chairman, 1982; RAB Major Regional Conventions Committee, 1980-81; RAB Transnational Activities Committee, 1980-81; United States Activities Board, 1976 (Vice Chairman), 1980-81; USAB Manpower Planning and Employment, 1974-75, Chairman, 1975; National IEEE Unemployment Workshops, Co-Chairman, 1974; USAB Professional Activities Committee, National Chairman, 1978; USAB Special Advisor for Government Affairs, 1977; USAB Task Force on Affirmative Action for Senior Engineers, Chairman, 1977-78; USAB Task Force on Increasing Responsibility of Engineers Toward Society, Chairman, 1978; USAB Task Force on Patent Rights, 1981-83; USAB Task Force on Service Contracts, 1981; USAB Task Force on Manpower, 1983. REGIONS: Region 1, Chairman, 1980-81. CONFERENCES: Socio-Economic Data Base Conference, Chairman, 1974. IEEE STAFF: Acting Head (Unpaid Volunteer), Washington Office, 1976. REPRESENTATIVE: RAB Liaison to the Technical Activities Board, 1983. CURRENT SOCIETY MEMBERSHIPS: Computer.

Statement by G. P. Rodrigue
Candidate for Executive Vice-President

The IEEE's strength is its members; this tremendous reservoir of talent is what makes IEEE work. The capable IEEE Staff facilitates the operation, but the vast majority of activities is done by volunteers.

IEEE has achieved preeminence in the dissemination of information through its publications and conferences. Volunteer effort makes these products available at costs well below those from commercial competitors.

Considerable work remains in developing Electrical Engineering as a lifelong professional career. Electrical Engineering offers exciting challenges to young people.

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Considerable work remains in developing Electrical Engineering as a lifelong professional career. Electrical Engineering offers exciting challenges to young people.

For too many, however, the promise of a stimulating, lifelong career is not fulfilled. IEEE must promote the quality of lifetime careers in engineering. We must greatly facilitate the continuing education of practicing engineers. I intend "continuing education" to include all aspects of improving and updating the capability of working engineers, not only formal courses. Review and tutorial articles and compendia should be emphasized in IEEE's publications in addition to the highly specialized papers of our journals. When experienced engineers have current training and capabilities, they should command better salaries and working environments. The techncial practice of engineering should hold adequate incentives (salaries, pensions, recognition) for continuing productivity.

Public understanding of technology is another area needing 'attention'. The public frequently feels threatened by developing technology; technology is viewed as a problem rather than as part of a solution to world problems. Through its Regional organization and its Public Information Committee IEEE should develop programs aimed at a better reciprocal understanding between engineers/scientists and the public.

The IEEE should continue to strive for cooperation with industry and other engineering societies. The engineering community can speak most effectively when a true consensus exists. However, the IEEE is primarily an organization of individual members and must serve their needs.

My engineering career of some twenty-five years has been approximately equally divided between industry and education. My IEEE activities have run the gamut from section and chapter activities through conferences and society offices to service on major committees and boards. This range of service has provided a good perspective of IEEE member concerns and Institute opportunities.

Biosketch

Dr. Rodrigue was raised in Louisiana and received his B.S. and M.S. degrees from Louisiana State University. After earning his Ph.D. in Applied Physics from Harvard University he joined the Sperry Microwave Electronics Company in Clearwater, Florida, as a Senior Engineer. In the period from 1958 to 1968 his work there included research and development on microwave ferrite materials and devices, parametric amplifiers, microwave acoustic delay lines, and microwave integrated circuits. He held various job titles, finally that of Research Staff Consultant.

After ten years in industry he joined the faculty of the School of Electrical Engineering at Georgia Tech where he has the rank of Regents' Professor. He teaches undergraduate and graduate courses in the areas of circuits, electromagnetics, and solid state. His research activities have included materials, microwave devices, and antenna measurements. He has been a consultant to a number of industrial and government organizations.

At Georgia Tech he has been active in matters of faculty governance and served as Chairman of the Georgia Tech Executive Board in 1981-82. He received distinguished teaching awards in 1971, 1972, and 1979, and has served on and chaired a wide range of faculty committees.

In the IEEE he served as President of the Microwave Theory and Techniques Society in 1976 and was on that ADCOM from 1970 until 1980. He chaired the Steering Committee for the 1974 International Microwave Symposium held in Atlanta, and he has served on the Steering Committees of the Conference on Magnetism and Magnetic Materials and the Sonics and Ultrasonics Symposium. He has been on the Technical Program Committees of many of the annual International Microwave Symposiums and of the Conference on Magnetism and Magnetic Materials, and the Intermag Conference.

He was an organizer of the Atlanta Section Chapter of AP/MTT and it's first chapter chairman. He also served on various committees of the Atlanta Section.

He was a member of IEEE's Technical Activities Board in 1976, 1979, and 1980. In the latter two years he was Chairman of the TAB Technologies Committees Administration. He has been a member of the IEEE Publications Board in 1977, 1978, 1982 and 1983. This is his second year as IEEE Vice President for Publications in which capacity he chairs the Publications Board. He has served as a member of the IEEE Board of Directors and it's Executive Committee for 1982 and 1983.

Dr. Rodrigue has served on a variety of IEEE committees including the Long Range Planning Committee, the Nominations and Appointments Committee, and the Finance Committee. He has also been an active participant on several standards committees.

He and his wife, formerly Mary Merritt, live in Atlanta with four of their six children.

President's Comments *Continued*

Deep Ocean Floor. We are also expanding the *OES Newsletter*. We will be including broad technology papers written on a more popular level of interest and directed toward a broad cross section of our members, to complement the specialized archival papers in the Journal. Technology committees can assist in organizing and/or submitting contributions to these publications.

As you can see, we are ambitious in what we hope to do now that we are a Society. To accomplish these objectives, we need your active involvement. You can become involved by contacting me, one of the OES officers or the cognizant person on the ADCOM, as given on the covers of the Journal or Newsletter.

Stanley G. Chamberlain
President, OES

'TIS A PUZZLEMENT

NEW PUZZLES

Puzzlement Editor: George V. Mueller, 2229 Indian Trail, West Lafayette, IN 47906

(Please send in your solutions. Also send in your puzzles.)

HARMONIC CONTENT OF A PERIODIC WAVE

The positive and negative sections of an alternating voltage wave are symmetrical. The first part of a positive section follows the curve $y = C_0 + C_1x + C_2x^2$ through the points (*o, o*), (45, 75) and (90, 100). The second part of the positive section follows another curve $y = C_0 + C_1x + C_2x^2$ through the points (90, 100), (135, 50) and (180, 0).

Use the expressions for C_0, C_1 and C_2 derived in the June 1983 issue of the *NEWSLETTER* and determine the fundamental, the third and the fifth harmonic components of the wave.

BALANCED LINE CURRENTS PRODUCED BY UNBALANCED DELTA PHASE CURRENTS

The phasor diagram of balanced line currents drawn by unbalanced delta phase currents of a 3-phase electrical system is an equilateral triangle with corners *a, b* and *c*. From a point *o* within the triangle one phase current *oa* is 80 amp, a second phase current *ob* is 60 amp and the third phase current *oc* is 100 amp. Determine the magnitude of the line currents.

PAST PUZZLES

Solution: Properties of a Parabolic curve

The positive portion of a symmetrical alternating voltage wave passes through the points (0, 0), (90, 100) and (180, 0) while following the parabolic curve $y = C_0 + C_1x + C_2x^2$.

1. Determine the half-period average value of the wave.
2. Determine the rms value of the wave.
3. Determine the fundamental, the third harmonic component and the fifth harmonic component of the wave.

1. In the June 1983 issue of the *NEWSLETTER* the values of C_0, C_1 and C_2 were derived in terms of the coordinates of the selected points. For this curve the values can be computed and stored. It was also shown that the area A under the curve from x_0 to x_2 was

$$A = C_0(x_2 - x_0) + C_1(x_2^2 - x_0^2)/2 + C_2(x_2^3 - x_0^3)/3 \text{ square units}$$

The half-period average value of this wave is the area divided by the base of 180 units. By substitution of values it is found that the half-period average value is 200/3 volts.

2. The rms value of the wave is

$$y_{rms} = \sqrt{\frac{1}{180}\int_{x_0}^{x_2} y^2\,dx} \text{ volts.}$$

Then

$$180y_{rms}^2 = C_0^2(x_2 - x_0) + C_1^2(x_2^3 - x_0^3)/3 + C_2^2(x_2^5 - x_0^5)/5 + 2C_0C_1(x_2^2 - x_0^2)/2 + 2C_0C_2(x_2^3 - x_0^3)/3 + 2C_1C_2(x_2^4 - x_0^4)/4$$

From which

$$180y_{rms}^2 = 960{,}000 \text{ and } y_{rms} = 73.03 \text{ volts.}$$

3. If the voltage $y = C_0 + C_1x + C_2x^2$ volts were applied to a wattmeter voltage coil and the unit sinusoidal current $i_{sn} = \sin nx$ amperes sent through the current coil, the power wave equation is

$$p_n = (C_0 + C_1x + C_2x^2)\sin nx \text{ watts}$$

Since trigonometric functions are now involved it will be necessary to use new values of C_0, C_1 and C_2 based on x values in radians. The energy J_{sn} watt-seconds over a base from x_0 to x_2 is

$$J_{sn} = \int_{x_0}^{x_2} p_n dx = \int_{x_0}^{x_2} (C_0 + C_1x + C_2x^2)\sin nx\,dx$$

After this expression is integrated, the limits substituted and terms combined there is obtained

$$J_{sn} = \frac{1}{n}\left[\cos nx_2(-y_2 + 2C_2/n^2) + \cos nx_0(y_0 - 2C_2/n^2)\right] + \frac{1}{n^2}\left[\sin nx_2(C_1 + 2C_2x_2) + \sin nx_0(-C_1 - 2C_2x_0)\right] \text{ watt-seconds}$$

For the fundamental component $n = 1$. Substituting that and the given values in the above equation yields $J_{s1} = 1600/\Pi^2$. Dividing that by the base of Π radians yields $1600/\Pi^3$ as the reading of the wattmeter which is the average power.

If V_{1m} is the maximum value of the fundamental component of voltage, $V_{1m}/\sqrt{2}$ is its *rms* value. The *rms* value of the unit fundamental current sent through the current coil is $1/\sqrt{2}$. The product of the *rms* voltage and the *rms* current is $V_{1m}/2$ and is equal to the average power. Hence $V_{1m} = 2(1600/\Pi^3) = 103.20$ volts.

By using the above equation, first with $n = 3$ and then with $n = 5$, the third harmonic component is found to be 3.82 volts and the fifth harmonic component is 0.83 volts.

Because the wave shape is symmetrical about the center ordinate at $x = \Pi/2$, there are no cosinusoidal components.

CORRESPONDENCE

July 18, 1983

Mr. Harold A. Sabbagh, Editor
Oceanic Engineering Society Newsletter
Analytics, Inc.
2634 Round Hill Lane
Bloomington, Indiana 47401

Dear Mr. Sabbagh:

Re.: Nikola Tesla

In his letter of April 11 appearing in the *Newsletter*, Mr. Robert Merriam* admonishes Nikola Tesla as if he were an errant child. Why? Tesla passed on *forty years* ago. Undoubtedly what augers Mr. Merriam is the fact that Reginald Fessenden lost a 1902 patent interference case (No. 21,701) to Tesla on a circuit for noninterference signalling, resulting in Tesla patent No. 725,606 which later has become commonly known as the fundamental AND circuit universally used in computer technology.

Sincerely,

H. E. Bollbach
8909 88th Street
Woodhaven, NY 11421

*Director, The New England Museum of Wireless and Steam, Inc.

CALL FOR PAPERS

Extremely Low Frequency (ELF) Communications

In July 1984 a special issue of the *IEEE Journal of Oceanic Engineering* will be devoted to communications at ELF in the ocean environment. Among the topics to be covered are the generation, propagation and reception of radio waves, modulation and coding, and noise processing. Papers on these, or other, topics are appropriate provided they are applicable to radio communication at ELF in which at least one terminal is in the ocean environment.

Prospective authors should prepare their manuscripts in the manner described on the back cover of the *IEEE Journal of Oceanic Engineering* and submit them by 15 October 1983 to the guest editor:

Dr. M. L. Burrows
M.I.T. Lincoln Laboratory
P.O. Box 73
Lexington, MA 02173

American Inventors' Stamps Honoring Electrical Engineers Unveiled

Denver, CO, June 9: A design of a block of four American inventors' stamps honoring electrical engineers was unveiled here today by the U.S. Postal Service during Board meetings of The Institute of Electrical and Electronics Engineers, Inc. (IEEE). The block of stamps honors Edwin Armstrong, Philo T. Farnsworth, Charles Steinmetz, and Nikola Tesla—all distinguished electrical engineers. The stamps were presented during a celebration of the first 10 years of IEEE professional activities by the Institute's United States Activities Board. IEEE is also preparing to celebrate its centennial next year, marking 100 years of progress in electrotechnology.

Edwin Armstrong, one of the four engineers pictured on the stamps, developed FM radio, announced in a meeting of the Institute of Radio Engineers (IRE), a predecessor organization of IEEE. Philo T. Farnsworth developed an early television camera. Charles Steinmetz applied advanced mathematics to electrical engineering, and was a president of the American Institute of Electrical Engineers (AIEE), a second predecessor organization of IEEE. Nikola Tesla was the inventor of the induction motor and a proponent of alternating current electrical systems.

The block of four 20-cent stamps recognizes the contributions of individuals to electrical engineering progress. IEEE President James B. Owens joined U.S. Postal Service R&D Laboratories Executive Director Walter T. Marable in unveiling the design. The stamps will formally be issued on September 21, 1983, at the Inventors Hall of Fame in Arlington, VA.

The IEEE, formed in 1963 with the merger of AIEE and IRE, is the world's largest technical professional organization having some 234,000 members in more than 120 countries. The United States Activities Board is the focal point of the Institute's U.S. professional activities in Washington, D.C.

Additional Biographical Background—Inventors' Stamps

Edwin Howard Armstrong (1890-1954) was born in New York and became interested in radio engineering as a high school student. He attended Columbia University and as an undergraduate made the first of his many inventions, an improvement for radio called the regenerative circuit. Later he developed the superhetrodyne circuit, which made radio receivers vastly more sensitive and stable. His third important discovery was superregeneration, which limited oscillation in amplification, and his greatest contribution was frequency modulation, or FM radio. Armstrong patented 42 inventions. He was a recipient of the Edison Medal of the American Institute of Electrical Engineers and the Medal of Honor of the Institute of Radio Engineers.

Charles Proteus Steinmetz (1865-1923) came to the United States in 1889 from Breslau, Germany, where he was a student at the University of Breslau. He joined the inventor Rudolf Eickemeyer in building electric apparatus at Yonkers, NY, and at the age of 27 formulated the law of hysteresis, which made it possible to reduce the loss of efficiency in electrical apparatus. When Eickemeyer's firm was bought by General Electric, Steinmetz joined the new company, beginning a 31-year relationship that ended only with his death. His improvements in methods of making calculations of current in alternating current circuits revolutionized power engineering, and his theory of electrical transients stood as another important contribution. A president of the American Institute of Electrical Engineers (1901-02), he also received the Elliot Cresson Gold Medal of the Franklin Institute.

Philo T. Farnsworth (1906-1971) was born on a farm near Beaver City, Utah and herded sheep as a young boy. As a high school student in Idaho he explained to his teacher his conception for sending pictures through the air, and he worked doggedly to create an all-electronic television system. After attending Brigham Young University he set up a laboratory in San Francisco and there, in 1927, transmitted his first image—a horizontal line. The next year he was able to send two-dimensional images and, after solving distortion problems, demonstrated a completely electronic television system on September 2, 1928. Farnsworth, who held 165 patents, founded the Farnsworth Television and Radio Corporation, and in addition to his television work also helped develop radar systems and special purpose vacuum tubes. The Institute of Radio Engineers presented him with the Morris N. Liebmann Memorial Award for important contributions to emerging technologies. He was a fellow of the American Association for the Advancement of Science and the IEEE.

Nikola Tesla (1855-1943) was born of Serbian parents in the village of Smiljan, in what is now Yugoslavia. He showed his technical brilliance early, but felt that his native country offered him only limited opportunities, so in 1884 he emigrated to the United States and soon began working for Thomas Edison. He soon struck out on his own, however, for Edison had little use for Tesla's bold new ideas—in particular, his brilliant solution to the problems of applying alternating curent in light and power systems. Tesla's polyphase ac system was brought to market by George Westinghouse, and after an acrimonious struggle with the Edison interests, who were wedded to the use of direct current (dc), the Tesla system became the standard in the twentieth century. Tesla's other inventions included the synchronous ac motor, devices for generating high voltage and high frequency currents, and contributions to radio technology. Tesla received the Edison Medal of the American Institute of Electrical Engineers in 1916.

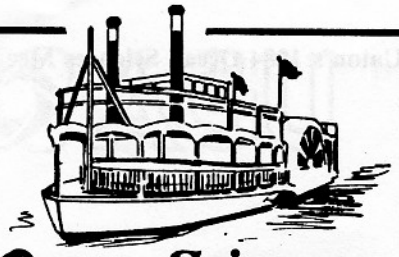
Forthcoming Journal of Oceanic Engineering Special Issues

Topic	1983 Issue Month	Submission Deadline	Guest Editor(s)
Tracking & Localization	July	past	James F. Bartram Raytheon Company Submarine Signal Division P.O. Box 360 Portsmouth, RI 02871
Atlantic Remote Sensing Land Ocean Experiment (ARSLOE)	October	past	Ledolph Baer NOAA C2X8 National Ocean Survey Rockville, MD 20852 and C. Linwood Vincent Coastal Engineering Research Center Kingman Building Fort Belvoir, VA 22060

IEEE CENTENNIAL YEAR

Topic	1984 Issue Month	Submission Deadline	Guest Editor(s)
Oceanic Seismic Exploration	January	April 15, 1983	Rui J.P. de Figueiredo Department of Electrical Engineering Rice University P.O. Box 1892 Houston, TX 77251 and Gerald H. F. Gardner Seismic Acoustics Laboratory AE Building University of Houston Central Campus Houston, TX 77004
Simulation Modelling	April	July 15, 1983	Stanley G. Chamberlain Raytheon Company Submarine Signal Division P.O. Box 360 Portsmouth, RI 02871
Extremely Low Frequency (ELF) Communications	July	October 15, 1983	Michael L. Burrows Massachusetts Institute of Technology Lincoln Laboratory Lexington, MA 02173
Acoustic Telemetry	October	January 15, 1984	Arthur B. Baggeroer Ocean Engineering Department Massachusetts Institute of Technology Cambridge, MA 02139

Topic	1985 Issue Month	Submission Deadline	Guest Editor(s)
Instrumentation Development for High Level Nuclear Waste Disposal Beneath the Deep Ocean Floor	January	April 15, 1984	Kenneth R. Hinga Graduate School of Oceanography University of Rhode Island Narragansett, RI 02882 and Armand Silva Ocean Engineering Department Narragansett Bay Campus Narragansett, RI 02882



Ocean Sciences Meeting

Abstract Deadline: October 19, 1983

New Orleans, Louisiana
Jan. 23–27, 1984

Call for Papers

Abstracts must be received at AGU by October 19, 1983. Late abstracts (1) may be summarily rejected by program chairman or (2) if accepted, will be charged a $25 late fee in addition to the regular publication charge and may not be published in advance of the meeting.

The 1984 Ocean Sciences Meeting of the American Geophysical Union (AGU) will be held January 23–27, 1984, in New Orleans. Housing and registration information will be published in *Eos* and mailed to anyone requesting information on the meeting. Cosponsoring societies are the American Society of Limnology and Oceanography (ASLO); the Acoustical Society of America (ASA); the American Meteorological Society (AMS); the Marine Technology Society (MTS); and the Institute of Electrical and Electronics Engineers Oceanic Engineering Society (OES).

General Regulations

Abstracts may be rejected without consideration of their content if they are not received by the deadline or are not in the proper format. Abstracts may also be rejected if they contain material outside the scope of the meeting or if they contain material already published or presented elsewhere. **Only one contributed paper by the same first author will be considered** for presentation; additional papers (unless invited) will be automatically rejected.

Abstracts not authored by a member of AGU or of one of the cosponsoring societies must be sponsored by such a member; this includes invited abstracts.

There is a publication charge of $40 ($30 if prepaid) for each abstract. The publication charge is only $20 ($15 if prepaid) if the first author is a student. Both invited and contributed papers are subject to the publication charge. Prepayment of the publication charge saves money. Send a check for $30 ($15 for students) with your abstract. Abstracts must be received at AGU by October 19 to avoid an additional $25 charge.

AGU will acknowledge receipt of all abstracts. Notification of acceptance and scheduling information will be mailed to corresponding authors in early December.

Abstracts

The abstract page is divided into two parts: the abstract itself and the submittal information. Please follow carefully the instructions for each part. Use a carbon ribbon to type the material, and do not exceed the maximum dimensions (11.8 cm by 18 cm) of the abstract. Abstracts that exceed the noted size limitation will be trimmed to conform without regard to content.

The meeting program will be prepared by photographing the abstracts exactly as they are received. Use the model abstract to prepare the final version. Submission of an abstract for an AGU meeting is presumed to carry with it permission for AGU to reproduce the abstract in all editions of *Eos* and in the programs and reports relating to the meeting. It is also presumed to permit the free copying of those abstracts. Although *Eos* is a copyrighted journal, authors are not requested to transfer copyright. Copyright, where it exists, will be reserved by the authors.

Submittal Information

Numbers refer to the items in the submittal-information block on the sample abstract.

1. Title of meeting.
2. Identification (abstracts not authored by a member of AGU or of one of the cosponsoring societies must be sponsored by such a member; this includes invited authors): Type name of society to which any of the authors belong, or if no author is a member, type the name of the society to which the sponsor belongs (indicated by XXXX on the submittal information block) and the sponsor's name.
3. Corresponding address: Give complete address and phone number of author to whom all correspondence (acknowledgment and acceptance letters) should be sent. Abbreviate as much as possible.
4. Discipline to which abstract is submitted (use the following letter abbreviations): A (Atmospheric Sciences); B (Biological Oceanography); C (Chemical Oceanography); G (Geological Oceanography); O (Ocean Technology); P (Physical Oceanography); S (Acoustical Oceanography); X (Other).
5. Type title of special session (if any) to which submittal is made.
6. Indicate your preference for a particular kind of presentation by one of the following letters: O, oral; P, poster. The chairman may assign you to either of these types of presentation in order to fit his or her program plan.
7. Percent of material previously presented or published, and where.
8. Billing information.

(*a*) Complete billing address if other than the corresponding address (item 3 above).

(*b*) If purchase order is to be issued, indicate number upon submittal of abstract.

(*c*) If a student member is the first author, the student publication rate is applicable. Indicate student rate applicable.

(*d*) If prepaid, enter amount enclosed.

9. Indicate whether paper is C (contributed) or I (invited). If invited, list name of inviter.

Poster Sessions

A large, centrally located meeting room will be set up for poster presentations. Experience from recent AGU meetings and from other scientific societies has shown that a poster presentation, while more demanding of the author, can provide a superb opportunity for comprehensive discussions of research results. If individual papers are deemed by a program chairman to be suitable for this type of presentation, they may be so assigned.

Presenters of poster papers are reminded that a poster exhibit requires careful preparation. Figures and text will be scrutinized in detail, and authors must be prepared to discuss the contents of their papers in depth. Under these conditions, well-prepared figures and concise, logical text are essential.

Program Committee

Meeting Cochairmen John R. Apel, Johns Hopkins University, and Richard T. Barber, Duke University

AMS James J. O'Brien, Florida State University
ASA Robert S. Winokur, ONR
ASLO Mary Jane Perry, University of Washington
MTS Ned A. Ostenso, NOAA

Special Sessions

Warm Core Rings
Air–Sea Interaction in Coastal Regions
Shelf Dynamics; CODE
Optical Dynamics Experiment
Marginal Ice Zone Experiment
California Current
Gulf of Mexico/Caribbean: Biological, Chemical and Physical Oceanography
Southern Oceans: Dynamics, Biomass
Kuroshio
Arctic Ocean: Dynamics, Biology, Acoustics
Seafloor Spreading Centers
El Niño and Climate Variability
El Chichón, Global Climate, Chemistry
Oceans and Atmospheric Chemistry: CO_2, N_2, Freons
Ocean Heat Transport: Climate, Paleoclimate
Acoustic Monitoring: Suspended Particulates, Biology
Acoustic Remote Sensing: Fine Structure, Internal Waves, Mesoscale Features
Acoustic Imaging: Sea Floor, Precision Bathymetry
Acoustic Tomography
Large Scale Ocean Observing Systems
SAR Surface Signatures
Ocean Tracers
Radioactive Disposal
Environment and Fisheries Year Class Survival
Zooplankton Behavior
Plankton Growth Rates in Oligotrophic Waters
Below Ground Processes in Wetland Ecosystems
Phytoplankton Responses to Fluctuating Environments
Aquatic Nitrogen Cycles
Interrelation of Optical and Biological Properties
Dynamics of Microaggregates in Oceanic Systems
Organism Growth and Behavior in a Turbulent Fluid
Biology and Physics of the Benthic Boundary Layer
Feeding Ecology of Fishes
Cyanobacteria: What are They Doing?

Sample Abstract

11.8cm

Technique for the Preparation of Abstracts

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S. C. N. D. AUTHOR (USGS, Woods Hole, Mass. 02543)
(Sponsor: I. C. Alvin)

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Use a good typewriter with a ribbon in good condition. A carbon ribbon gives the best results. Please use type of about this size. Use 12 pitch. There will be a reduction of 50% for the printed abstract volume.

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(2) Leave one line blank after title.
(3) Type names of authors in all capital letters, with affiliation and address in capital and lower case letters. Do not leave blank lines between authors.
(4) Underscore the name of author who will present paper.
(5) If no author is a member of a cosponsor society, type sponsor's name in capital and lower case letters.
(6) Leave one blank line after author block.
(7) Neatly drawn in symbols or Greek letters are acceptable. Use India ink.
(8) Use SI units.

18 cm

NOTE: There are no special forms distributed for typing abstracts. You may trace this form in nonreproducible ink. Please leave at least 4 cm between top edge of paper and abstract title. Type abstract as close as possible to left edge of paper.

Submittal Information
(See explanation)

1. Ocean Sciences Meeting
2. AGU, ASLO, MTS, OES, AMS or ASA
   or
   XXXX (sponsor's name)
3. (a). Corresponding address:

   S.C.N.D. Author
   MS 123
   USGS
   Woods Hole, MA 02543

   (b). Telephone number
   617-548-1234
4. A (Atmospheric Science)
5. Special Session:
   Deep-Sea Drilling
   (or none)
6. P (Poster)
7. 10% at AGU Spring Meeting
8. (a). Hydro Univ.
   Accounting Dept.
   Admin. Bldg.
   Watertown, MA 02172

   (b). P.O. #5684739

   (c). Student rate applicable

   (d). If prepaid enter amount enclosed. (P.O.'s requiring invoicing are not eligible for discount rate)
9. C (Contributed)

Abstract Deadline:
October 19, 1983
Mail original and two copies to
Ocean Sciences Meeting
American Geophysical Union
2000 Florida Avenue, N. W.
Washington, D. C. 20009

AGU

American Geophysical Union
2000 Florida Avenue, N.W.
Washington, D. C. 20009
Phone (202) 462-6903
TWX 710-822-9300

April 28, 1983

Dr. Stanley G. Chamberlain
Raytheon Company
P. O. Box 360
Portsmouth, Rhode Island 02871

Dear Dr. Chamberlain:

The 1984 Ocean Sciences Meeting 'Call for Papers' has been published in EOS Transactions, American Geophysical Union, April 5, 1983. A copy is enclosed. A separate two-sided flyer is also enclosed. We will mail these on request. I am also enclosing a zerox of our EOS ad, published May 3 in EOS. If you require stats for publishing, please contact me.

Registration and housing material will be published in EOS on August 2. Your members will be able to register at the AGU member rate. This information will be sent to anyone who asks to be placed on the mailing list.

Sincerely yours,

Anne Greenglass

Anne Greenglass
Meetings Manager

AG/djj

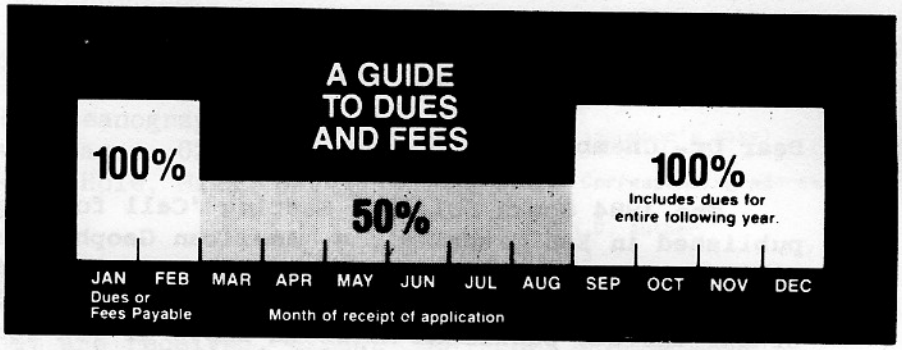
Enclosure

Now is the best time to join our society.

It's always time to upgrade your career. Membership gives you ready access to state-of-the-art meetings and conferences in your areas of interest, and to their published proceedings. You get to meet experts from other organizations and to participate in technical activities with the prime movers in engineering, science and business. Our membership is worldwide.

The *Journal* of the Society is included in your Society fee, keeping you abreast of the latest developments in your field. And, as an IEEE member, you may choose from a wide range of books, Standards, conference records, employment surveys, short courses and other career-building aids—all at discounted member prices.

Please take this opportunity, now, to broaden your outlook, open your mind to new concepts, new techniques, new fields of interest. There will be no better time. Return the Membership Application form below. *(Students should contact their IEEE counselor or write for Student Membership brochure.)*



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Name of educational institution _____

Course _____ Degree received _____ Date _____

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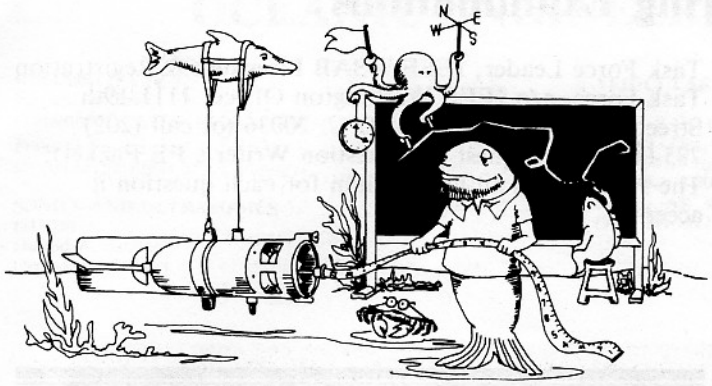


CURRENT MEASUREMENT TECHNOLOGY COMMITTEE NEWS AND INFORMATION

A primary objective of the Current Measurement Technology Committee (CMTC) of the Oceanic Engineering Society (OES) is to provide a focus for information exchange and promote cooperation and coordination among those in the marine community involved in current measurement. To this end, this column is being established as a regular feature of the *OES Newsletter* and everyone is encouraged to participate by submitting news items and information about active or planned current measurement efforts to Bill Woodward (301) 443-8444 or Jerry Appell (301) 443-8026 for publication in the column. This will be an effective forum only if everybody participates, so let's hear from you.

InterOcean Systems, Inc., introduces a new Solid State Spherical Electromagnetic Current Meter. The S-4 current meter is a microprocessor driven, spherically solid instrument made of high strength dimensionally stable plastic with a titanium main load bearing shaft. The compass and all electronics including data storage (CMOS static RAM) and power supply are sealed within the sphere, though an electrical port allows data to be retrieved without opening the instrument housing. The S-4 is a rugged, hydrodynamically stable design with no delicate moving parts or fragile sensors and the EPROM formatted microprocessor affords a large degree of data sampling/recording flexibility and simplicity of use.

(Contact Ken Lawson, InterOcean Systems, Inc., (619) 565-8400.)

As more attention is being focused on current measurements in the near surface and wave induced zones, there are a number of experiments on intercomparing various self-recording current meters. A recent intercomparison test between the EG&G VMCM, the Simrad and the Aanderaa was performed by the Continental Shelf Institute in Trondheim, Norway. I.O.S. in Victoria, Canada is in the process of evaluating the data from an intercomparison of Aanderaa, EG&G VMCM, Neil Brown, Sea Data and Simrad current meters. For information regarding these intercomparison tests contact: Dr. Tore Audunson, (075) 15660, Telex 55548, Stan Huggett, (604) 656-8363.

The National Ocean Service of NOAA deployed an AMETEK-STRAZA DCP 4400/300 bottom-mounted acoustic doppler current profiler near Ambrose Tower, New York in August of 1983. The system operates in real time with data being received in NOAA's Rockville, MD headquarters. Several "sea truth" experiments will be conducted during the planned 1-year operation.

(Contact Jerry Appell (301) 443-8026.)

NAVOCEANO is beginning a test and evaluation program on current measuring systems. Tests will soon begin on the Neil Brown Instrument Systems (NBIS) ACM-2 and DRCM acoustic type current meters. NAVOCEANO is also providing a calibration service to the community on a reimbursable basis at the Naval Southeast Regional Calibration Laboratory (NSRCL) located in Bay St. Louis, MS.

(Contact Carlos Mayoral (601) 688-4618.)

Editors Note: The news that NAVOCEANO is providing calibration services and performing T&E on current measuring systems is welcome news in view of the fact that the NOAA laboratories, namely the Engineering Support Office (formerly NOIC) has been closed down.

Recent Technical Papers

Mero, T. N., G. F. Appell, D. L. Porter, "Sea-Truth Experiments on Acoustic Doppler Current Profiling Systems," Oceans '83 Conference.

Pettigrew, N. R. and J. D. Irish, "An Evaluation of a Bottom-Mounted Doppler Acoustic Profiling Current Meter," Oceans '83 Conference.

Professional Engineering Examinations

For a number of years there has been much discussion and debate within the engineering community and the IEEE concerning the efficacy of examinations as a means of determining competency to be licensed to practice a given engineering discipline. The National Council of Engineering Examiners (NCEE), a body composed of representatives of each State Board of Engineering Examiners, has been able to forge agreement among the various states to standardize one common examination to the point that 48 out of the 50 states now utilize the uniform examination.

Historically, the IEEE's involvement with the NCEE had been minimal until the mid-1970's at which time the United States Activities Board (USAB) Registration Task Force began to look at the question of the adequacy of the examination to the practice of the disciplines encompassed within the electrical engineering profession.

The area of question adequacy has been reviewed by the NCEE with the cooperation of our task force and at minimum two basic areas needing improvement have been identified:

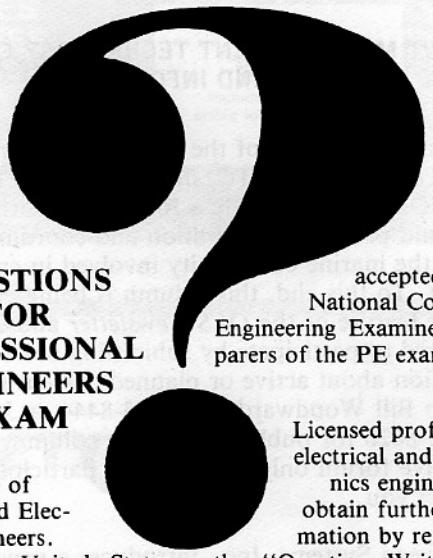
a. The orientation of a majority of writers of questions is basically academic resulting in textbook-type questions which have little relevancy to the real work world an engineer must deal with; and
b. The level and type of question lags the state-of-the-practicing-art of Electrical Engineering by five to ten years.

You can play a part in providing the leadership and the capability to make the Professional Engineering Examinations more relevant to the practice of modern engineering by providing examinations that properly test for competency to practice.

The IEEE is in the process of establishing a system that will provide a continuing source of examination questions to the NCEE for their use in examining electrical/electronics engineers requesting licensing under the various jurisdictions. The Task Force currently estimates that it will take at least 60 writers, each writing one question per year to supply NCEE's needs and build up a reserve of unused questions.

Also, if you're interested in developing questions for the examination, please write to: Joel Snyder, PE, Co-Task Force Leader, IEEE/USAB Licensure & Registration Task Force, c/o IEEE Washington Office, 1111 19th Street, N.W., Washington, D.C. 20036 (or call (202) 785-0017 and request the Question Writer's PE Packet). The NCEE pays an honorarium for each question it accepts.

LICENSED EE's SOUGHT TO DEVELOP QUESTIONS FOR PROFESSIONAL ENGINEERS EXAM



The Institute of Electrical and Electronics Engineers, Inc. (IEEE) United States Activities Board (USAB) is seeking licensed Professional Engineers, electrical and electronics, who may or may not be IEEE members, to develop questions for the electrical engineering portion of the Professional Engineering (PE) examination. Honoraria will be given for questions accepted by the National Council of Engineering Examiners, preparers of the PE exam.

Licensed professional electrical and electronics engineers can obtain further information by requesting the "Question Writer's PE Packet" from Joel B. Snyder, PE, Co-Task Force Leader, IEEE/USAB Licensure & Registration Task Force, c/o IEEE Washington Office, 1111-19th Street, N.W., Suite 608, Washington, DC 20036. Or, call the IEEE Washington Office, (202) 785-0017, and request the "PE Packet."

OCEANIC ENGINEERING SOCIETY(continued)

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(Treasurer)

Francois Envent
(Social Implications of Technology)

SONICS AND ULTRASONICS (SU-20)
Harold A. Sabbagh
(Newsletter Editor)

VEHICULAR TECHNOLOGY (VT-06)
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