IEEE
OCEANIC ENGINEERING SOCIETY
NEWSLETTER

VOLUME XXII NUMBER 2

EDITOR: HAROLD A. SABBAGH SUMMER 1988 (USPS 420-910)

IEEE Oceanic Engineering Society Newsletter is published quarterly by the Oceanic Engineering Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 345 East 47th Street, NY 10017. Sent automatically and without additional cost to each memeber of the Oceanic Engineering Society. Printed in U.S.A. Second-class postage paid at New York, NY and at additional mailing offices. Postmaster: Send address changes to IEEE OCEANIC ENGINEERING SOCIETY NEWSLETTER, IEEE, 445 Hoes Lane, Piscataway, NJ 08854.

CALL FOR NOMINATIONS
OES ADMINISTRATIVE COMMITTEE

The Oceanic Engineering Society Nominating Committee invites you to submit nominations for the OES AdCom ballot. Volunteers are welcome, also. The election of new AdCom members will be conducted in the fall of 1988. The final slate of candidates placed on the ballot will be selected by the Nominating Committee. However, nominations accompanied by a petition signed by 25 OES members will be guaranteed a place on the ballot.

We seek nominations of individuals willing to help us build a strong, dynamic Oceanic Engineering Society. They must be willing to attend the two ADCOM meetings each year, held during the OCEANS Conference in the Fall and the Offshore Technology Conference held each May in Houston. They must also be willing to work on projects between the meetings.

The individuals nominated must express a willingness to be considered by the Nominations Committee and to appear on the ballot. They must provide a brief biography listing professional activities, current affiliations and participation in IEEE activities in the format used for authors in the Journal. Please submit nominations and supporting material no later than August 15, 1988 to:

Anthony I. Eller
OES Jr. Past President
SAIC
1710 Goodridge Drive
McLean, VA 22102

SENIOR MEMBERSHIP IN IEEE

If you have been in engineering for 10 years and have had 5 years of significant engineering experience, you are eligible for Senior Membership in IEEE, regardless of whether you are now a member of IEEE or not. We are encouraging all of the readers of this newsletter to apply for Senior Membership if qualified.

There is no dues increase over IEEE member rates.

However, there is a prestige associated with Senior Membership and you cannot be elected a Fellow in IEEE unless you are a Senior member. You cannot apply for Fellow Membership, nor can your colleagues nominate you for Fellow grade unless you are a Senior member.

Application for Senior Membership is simple. Call (201) 981-0060 and ask for a Senior member packet. You will need at least 3 Senior members as references.

Call me if I can help.

Ed Early
OES Membership Chairman
(206) 543-3445

CALL FOR OCEANS CONFERENCE SITE PROPOSALS

The Conference Committee of the IEEE Oceanic Engineering Society invites the submission of proposals to organize and host OCEANS Conferences for the years 1990 through 1994. OCEANS is a series of technical conferences dedicated to the application of electrical engineering technologies in the ocean environment, as well as to related legal, social and scientific issues. OCEANS Conferences are held in the fall of each year in cities having a tie to marine interests.

Proposals to host an OCEANS Conference must be submitted by a member of the Oceanic Engineering Society. It is desirable but not absolutely required that the proposal be endorsed by the local IEEE Section at the proposed Conference site. Criteria for selection will include suitability of the proposed city, experience and stability of the local volunteer committee, and the proposed conference management plan. The first milestone would be a presentation to the OES Conference Committee at OCEANS 88, 31 October - 2 November 1988 in Baltimore, Maryland. Selection of OCEANS sites will be based in part on the information presented at that time.

Anyone interested in presenting a proposal should first contact either Tony Eller (703) 734-5880 or Toby Raisbeck (207) 773-6243.

INSTRUMENTATION AND MEASUREMENTS IN THE POLAR REGIONS:

A REPORT ON A WORKSHOP

INTRODUCTION

A workshop entitled "Instrumentation And Measurements In The Polar Regions" was held in Monterey, California during the period 27-29 January 1988. The workshop was co-sponsored by the IEEE/OES and the Marine Technology Society (MTS).

The Monterey workshop was the first of its kind, in that it dealt exclusively with the means and methods for making scientific and engineering measurements in the polar regions, together with the analysis and interpretation of data collected in these regions. Large-scale polar engineering issues, such as the design of offshore structures, seafloor completion systems, and so on, were specifically excluded from this workshop since they have been (and continue to be) dealt with in other conferences and workshops such as the Offshore Technology Conference (OTC).

From both a technical and a financial point-of-view, the Polar Workshop was successful. Significant new technical information in 5 topic areas was presented to 75 registrants, and a timely and high quality Proceedings was prepared. Income from the workshop slightly exceeded expenses. Analysis of a questionnaire circulated to the registrants indicated that they felt that both the time frame and workshop format were appropriate to the subject matter, and that similar workshops should be held every two years.

This report provides a background leading to the workshop, it describes the organization of the workshop and summarizes the roles of the various workshop committees, and gives an outline of the workshop format. Conclusions and recommendations for future, similar workshops are also provided. A financial summary of the Workshop is given in the Appendix to this report.

BACKGROUND

The origins of the Polar Workshop go back to the early 1980's. At that time, the then-Chairman of the San Francisco Bay Region Section (SFBR) of the MTS, Steve Bailey, raised the question of a Section-initiated conference or workshop. The purpose of this conference would be to address an issue of technical significance and need in the area of marine science and technology, stimulate Section growth and activity, and provide an improved financial position for the SFBR Section. It was also desired that the central theme or technical area for the conference revolve around particular competences and activities in the San Francisco Bay Area. The subject area for the then-undefined conference turned out to be a most difficult quest because, following a survey of the work in the Bay Area, there was no one work area in marine science and technology there that dominated the others. Thus, unlike the strong undersea interests found in San Diego that led to the ROV conferences, for example, the San Francisco Bay Area appeared to offer a thin and nearly uniform mix of ocean-related technical fields.

Following a prolonged gestation period, the concept for the Polar Workshop took shape in 1985. It had been determined that there was some arctic-related work going on in the Bay Area, that there would be increasing emphasis in this area by commercial and government organizations, and that little had been done in the way of technical symposia that focussed on the instrumentation requirements in this hostile part of the world. It was decided that this topic might be of sufficient interest to warrant a separate conference, without seriously impacting other conferences such as OTC and OCEANS that only lightly touched on these concerns.

In mid-1985, a strawman proposal was prepared and circulated to individuals in IEEE and MTS, particularly the officers of IEEE and MTS, the chairs of the various technical committees, and others known to the author. The strawman proposal described a symposium dealing with instrumentation and measurements in the arctic, to be held in the winter of 1988. The proposal outlined rationale, broad goals, and candidate subject areas that could be considered in a 3-day, 250-registrant, conference. The proposal was not intended to be an action plan endorsed by any particular Society; rather, it was prepared to stimulate discussion to determine the need and potential support for such a conference.

Following numerous one-on-one discussions, the SFBR Section of MTS called together several people in the Bay Area in late 1986 to talk about preparing a more formal proposal for such a conference. Since there was no IEEE/OES Chapter in the Bay Area, the IEEE was represented at this meeting by CDR. Bob Cassis (USCG) and Dennis Douglas, both of whom were trying to start an OES Chapter in the Bay Area. MTS was represented by (then) Section Chair Don Selle, Vice-Chair Ross Smart, Secretary Albert Rodriquez, and by Section members Warren Denner, Jim Wenzel, and Elmer Wheaton. (Both Wenzel and Wheaton were instrumental in the OCEANS '83 conference — Wenzel was the General Chairman and Wheaton was the Program Chairman.) It was decided at this meeting that such a conference should go forward and that it should be held in the Bay Area. No other formal action was taken, pending the preparation of a formal proposal to be submitted to the National Offices of MTS and IEEE for approval.

The idea for such a conference languished because no one person wanted to champion the conference and then "get stuck" with the responsibility for doing the whole job without support from others. In the late winter of 1986, Warren Denner contacted Dennis Douglas and Ross Smart to inquire about the status of the conference, and to offer

his services to help. Dr. Denner's enthusiasm for the conference led to an initial planning meeting between Denner, Smart, and Douglas, which ultimately led to the workshop held on 27-29 January 1988. It was decided at that first meeting that the conference *would* be held, and that the three people at the meeting were and would continue to be the core committee — the so called "Executive Committee".

By the end of the second meeting of the Executive Committee, most of the foundation for the ensuing technical symposium had been laid: a date of late January 1988 was picked as the tentative date for the conference; that the scope of the symposium should be trimmed back from a planned registration of 250 people to 75 people, that the meeting should be in a "workshop" format, over a 2-day period, and that a Proceedings would be produced to serve as the workshop Record. It was further decided that the best place to hold the meeting was in Monterey, and because of Dr. Denner's highly regarded reputation in the area of polar research, that he should serve as General Chairman for the Workshop.

ORGANIZATION

The organization of the Polar Workshop was centered around the Executive Committee, with other "committees" and individuals brought in as necessary. Except for the Executive and Treasurer positions, there were no other standing committees with long-term, well-defined goals. Even the traditional "Publications" and "Arrangements" committees were ill-defined, with the needed functions carried out by members of the Executive or others, as necessary. From the very beginning, the emphasis was placed on the technical aspects of the Workshop — to provide the very best technical meeting possible — everything else was of lesser priority. As it turned out, this loose and ad hoc structure was entirely adequate to cope with the problems presented, and may even have contributed to the success of the Workshop.

It is difficult (maybe impossible) to diagram the actual organization and hierarchy of the Workshop, since so many individuals did so many different roles. Figure 1 (taken from page *ii* of the Proceedings) shows a list of the people who were involved with the Workshop in a variety of ways. Some people played a major and sustaining role, others were only slightly involved.

Viewed from the outside, the Workshop "worked" as a result of three key component-"players": the "conceptualist", the "planner", and the "executioner". The Conceptualist (in this case, Dr. Denner) served to provide the broad input to the Planning function and to use his technical knowledge of the subject area, as well as the contacts he had developed over the years, to define the program and the contents of the program. (Dr. Denner also served as Chairman of the Technical Committee, and thus was responsible for the quality of the papers presented at the Workshop.) The Planner served to implement the conceptualist's inputs, to establish and maintain timelines, and to try to keep the Workshop at least one step ahead of the "alligators" waiting around every decision point. The Executioner (Mr. Smart, in this case) served to implement all the plans and to either take action or see that the needed actions were taken, when they had to be taken.

COMMITTEE MEMBERS

THE EXECUTIVE COMMITTEE

Warren Denner
(Science Applications International Corp.)

Dennis G. Douglas
(Science Applications International Corp.)

Ross Smart
(Chevron Research Company)

THE TECHNICAL COMMITTEE

Dr. Vera Alexander
(University of Alaska)

Dr. Ira Dyer
(Massachusetts Institute of Technology)

Dr. Ken Davidson
(Naval Postgraduate School)

Dr. Ben Gerwick
(University of California)

Dr. Willford Weeks
(University of Alaska)

Dr. Elliot Weinberg
(Naval Postgraduate School)

THE SUPPORT STAFF

Steve Balinski
(San Jose State University)

Eleanor Estes
(Science Applications International Corp.)

Albert Rodriguez
(Lockheed)

Don Selle
(Chevron Shipping Company)

Robert Wade
(Science Applications International Corp.)

Janet Wall
(Science Applications International Corp.)

FIGURE 1

The foregoing should not be construed to denigrate the important roles taken by others, particularly the roles served by the Support Staff during the Workshop itself. It IS intended, however, to point out that a technically significant meeting can be presented with a minimum of people. In fact, since so few people were involved, right up until the dates of the Workshop, it made it easy to coordinate the needed activities.

SCHEDULE

It was the norm for this Workshop to always be behind schedule. Whereas a workshop such as this might normally be announced one year or more in advance, the Executive didn't commit to the Workshop until 8 months before the scheduled date. The Call for Papers for the Polar Workshop went out a scant 4-months before the Workshop date, instead of a more traditional 8-months to a year before. Papers were accepted for the Workshop, on the basis of abstracts submitted by the authors, just 2-months before the Workshop, and the auhtors were only given 1-month to prepare their papers after they were notified of acceptance.

The planned schedule for preparing and printing the Proceedings called for a 1-month's effort, which was small enough. As it turned out, the Proceedings cover, table of contents, and acknowledgements were prepared, the submitted papers were organized and paginated, and 125 copies of the Proceedings were printed and bound, all in one week. (The Proceedings were finished on the evening before the Workshop began...)

Most of the schedule problems occurred as a result of the late start in the announcement of the Workshop.

WORKSHOP FORMAT

The specific topic areas sought for the Workshop was a matter of significant discussion by the Executive Committee. The technical subject, "Instrumentation and Measurements in the Polar Regions", was like a pie that could be sliced many ways. After evaluating the various possibilities, it was decided that the best division of topic areas was: meteorology, oceanography, ice, biology, and geophysics. As appropriate, each topic area could be further subdivided into in-situ and remotely sensed categories. After the abstracts had been received, it became clear that there was a shortage of papers in the area of polar biology. It was later learned that there was a biology-related conference in New Orleans at about the same time as the Polar Workshop, which may account for the shortfall of papers in this area.

Early on it had been decided that the meeting would be held in a workshop format, even though that format had not been precisely defined. It was later decided to hold the Workshop in plenary session, rather than multiple, simultaneous sessions. This decision was made for two reasons: 1) the Executive Committee felt that a plenary session could offer cross-pollenization of technical ideas amongst the different disciplines that would be represented, and 2) the Monterey Bay Aquarium (the site of the Workshop) offered a large conference auditorium, but too few individual meeting rooms for the 5-topic areas.

There was an additional reason for the plenary format. At the outset, some members of the Executive felt that, because of the delays in announcing the Workshop and getting out the Call for Papers, that too few papers would be received to fill out multiple sessions, and that because of the (apparent) emphasis on remote sensing, multiple sessions would be unbalanced. As it turned out, many more high quality papers were offered to the Workshop than could have been accommodated in a 2-day meeting. Rather than turning down good papers, the Executive decided to extend the meeting to three days. This decision was not made until about 1-month before the Workshop.

Although the "word" about the 1-day extension was spread as rapidly and as widely as possible, there were several people who had made definite travel plans and could not stay the extra day. Some did not learn of the extension until the day of the Workshop. This required that some papers be re-scheduled on the first day to meet the travel requirements of the presenters. There were also some attendees who had come to hear a specific paper that (as a result of the extension) was to be presented on the last day, but who could not stay to hear that paper. While some adjustments were made to accommodate the listeners as well as the presenters, at least one registrant was disappointed.

Except for the adjustments made to the presentation order as described above, the Workshop presentations and the Proceedings were coordinated, so that the presentations roughly followed the Proceedings. This allowed the audience to follow along with the presentations.

CONCLUSIONS AND RECOMMENDATIONS

Overall, the Workshop on "Instrumentation and Measurements in the Polar Regions" was a technical and financial success. For the benefit of groups that might plan a small technical workshop, the "Lessons Learned" from the Polar Workshop include the following:

- Establish a core Conference Committee and Commit to a specific date at least one-year before the planned workshop or conference.
- Keep the core group as small as possible; three is probably enough for a Workshop of 2-3 days, with 75-100 registrants, and no exhibits.
- Solidify the program dates and format early. Don't change dates or program durations too close to the event date.
- Establish a set of firm timelines for the various milestone events at least one year before the planned date. Allow a "buffer" in these timelines to compensate for the inevitable delays.
- Have a General Chairman who is both knowledgeable and respected in the technical subject area, and who has many contacts to draw on for key papers. (Without this background in Dr. Denner, it is unlikely that the Polar Workshop would have been successful, especially given the late start and lack of "advertising" that was done...)
- Publish a Proceedings. It is the only lasting record of the meeting.

During the Polar Workshop, a questionnaire was circulated to the registrants that asked questions regarding the technical substance of the Workshop, the quality of the presentations, the timing of the meeting, the format, and so on. About 50% of the registrants responded. An analysis of the replies showed that the Polar Workshop had been well received and that both the duration and the mid-winter time for this Workshop was right for the subject. One question on the survey asked about the potential for future workshops. All respondents indicated that future workshops were needed, and the consensus was that they should be held every two years.

The Executive Committee of the 1988 Polar Workshop recommends that another 3-day workshop be planned for the winter of 1990. With sufficient advanced planning, it should be possible to attract at least 150 registrants. It is further recommended that the Polar Workshop concept be implemented as a regular workshop activity.

FINANCIAL SUMMARY

Appendix "A" of this report provides a final financial summary of the Polar Workshop. The preliminary budget for the Workshop was premised on 75 attendees, each paying a registration fee of $100. At the outset, all of the

budget estimates were guesses. Because the Committee was so loosely structured, most of the estimates remained just that until the workshop actually began. As it turned out, 75 people registered at the Workshop.

Loans in the amount of $2000.00 and $500.00 were made to the Polar Workshop by the IEEE/OES and SFBR/MTS, respectively, to provide seed money for the Workshop. These loans have been repaid from the proceeds of the Workshop. In addition, in recognition of the sponsorship of the IEEE/OES and MTS, the Polar Workshop Committee offered to remit to each the IEEE/OES and MTS/National, an amount equal to $5.00 for each registrant, regardless of the Society affiliation of the registrant. These amounts ($375.00 to each IEE/OES and MTS) have also been paid from the proceeds of the Workshop. It is recommended that future Workshops agree to pay the sponsoring Societies a larger sum per registrant, on an affiliated basis.

Additional income was received as a result of the sale of excess copies of the Proceedings to MTS/National for resale.

The excess income from the Polar Workshop has been deposited with the SFBR Section of the MTS. These monies are to be used to further the programs of the SFBR/MTS and to help initiate a Chapter of the IEEE/OES in the San Francisco Bay Area.

APPENDIX — FINAL FINANCIAL SUMMARY

WORKSHOP ON INSTRUMENTATION AND MEASUREMENTS IN THE POLAR REGIONS

FINAL FINANCIAL REPORT INCOME STATEMENT
(See Note 1)

INCOME:			
• Registration (75 pers. @ $100/pers.)	$7,500.00		
• Advances			
IEEE/OES	$2,000.00		
SFBR/MTS	$500.00		
• Interest	$63.19		See Note 2
• Dinner/Proceedings/Pastrys	$2,700.00		
• Post-Wrkshp sales of Proc.	$900.00		See Note 3
TOTAL INCOME		$13,663.19	

WORKSHOP ON INSTRUMENTATION AND MEASUREMENTS IN THE POLAR REGION

FINAL FINANCIAL REPORT
EXPENSE AND DISPOSITION STATEMENT
(See Note 1)

EXPENSES:			
• Dinner & Coffee Service	$3,102.35		
• Typing Service	$228.75		
• Postage	$200.00		
• Copying /Xerox	$396.50		
• Miscellaneous Supplies	$90.87		
• Proceedings	$4,091.00		
• Final Program	$46.64		
• Kick-Off Dinner/VIP's	$200.00		
• Prizes for Slide Contest	$69.21		
• Hotel for Exec. Comm.	$439.21		
• Return of Advances			
to IEEE/OES	$2,000.00		
to SFBR/MTS	$500.00		
• Sponsorship fee			
to IEEE/OES	$375.00		See Note 4
to MTS/Nat'l	$375.00		See Note 4
TOTAL EXPENSES		$12,114.53	
EXCESS INCOME (to SFBR/MTS)		1,548.66	See Note 5

Note 1: Statement based on records submitted to SFBR/MTS from Workshop Treasurer

Note 2: Estimated from records

Note 3: Post-Workshop sale of excess Proceedings to MTS/Nat'l; funds not yet received as of 30 April 1988

Note 4: Agreed to by Workshop Exec. Comm.

Note 5: Portion of excess income to be used to foster an IEEE/OES Chapter in the Bay Area

ATTENDANCE UP FOR OTC '88

Attendance was up approximately 5% from last year at the 1988 Offshore Technology Conference (OTC) held May 2-5 at the Astrohall in Houston, Texas. The outlook was generally optimistic among the greater than 26,000 attendees.

The technical program for the twentieth OTC was again outstanding. Luncheon and special session topics included the USS Monitor salvage operations, the management of subsidence at the Phillips Ekofisk field, the novel Placid Oil Co. development in the Gulf of Mexico, and a look ahead to the next twenty years. The offshore potential of Canada was the subject of a keynote address and a panel discussion by government and industry leaders.

Plans are already underway for OTC 1989; the challenge of operations in increasingly deeper water is a major theme for the technical program. Proposed session topics for OES sponsorship include the state-of-the-art in Remotely Operated Vehicles and offshore instrumentation.

ELECTION '88

Dear IEEE Colleague,

Each year you vote to participate in IEEE by renewing your membership. Yet, having thus voted with their checkbooks, many members don't participate in the annual election of leaders.

I believe this is unfortunate. Let me explain:

Hard, dedicated work, not chance, has made the IEEE the largest technical professional organization in the world. This year it will welcome its 300,000th member. This growth has been nurtured through the efforts of thousands of IEEE volunteers. They run technical conferences, section and chapter meetings, edit journals and magazines, and participate in our diverse professional and educational activities.

Some volunteers go further. They run for elective office at the local or transnational level. With few exceptions, these individuals devote substantial time to their volunteer positions. In the process, they make the IEEE ever more responsive to member needs. Their success is evident by the continuing growth, financial health, and worldwide recognition we enjoy year after year — a success achieved in recent years with no increase in your membership dues.

The IEEE leadership uses periodic surveys to find out what you want and how you are reacting to IEEE services. Our U.S. members told us in a recent survey that the most important reasons why they stay in IEEE are to keep up with their area of technical expertise and to get an overview of related technical fields. Undoubtedly these factors are equally important to our members outside of the United States. In the survey, U.S. members ranked *IEEE Spectrum* and Society technical activities as the IEEE's most important services to the profession and to themselves personally.

The IEEE's continuing success requires that highly qualified members be selected for leadership positions, especially on the Board of Directors. The Board not only makes policy and financial decisions for a multimillion dollar organization that runs 300 major conferences each year and publishes more than 60 journals and magazines, its members also represent you in government forums and in interactions with other technical leaders and organizations throughout the world.

I believe the role of the Board of Directors is to select two candidates for President-Elect who they believe have demonstrated effective leadership. In addition, this year it is likely that there will be one or more petition candidates. Please review and compare the activities and qualifications of all the candidates for all offices. In addition, this year, for the first time, you will have an opportunity to vote for any and all candidates for President-Elect, Executive Vice President and other members of the Board of Directors who, in your opinion, will lead the IEEE to continued success.

The person you select for IEEE President-Elect will represent all of us. His actions and communications will be viewed by others as representative of those of electrical engineers and our profession. If he exercises his responsibilities wisely, the IEEE will remain the most useful and prestigious professional organization of its kind. Your thoughtful vote will help achieve this goal.

Henry Bachman
1987 IEEE President

APPROVAL VOTING

IEEE has joined several other professional societies in adopting Approval Voting in order to provide members with greater flexibility in expressing their preferences. Approval voting permits you to cast one vote for each candidate you approve of or find acceptable. Each vote counts equally, and the candidate with the most votes (i.e., approval) wins.

If you approve of all candidates, you may vote for all. If you approve of none, you may vote for none. A vote for all or none of the candidates may express your view, but it will not affect the outcome.

To have the greatest influence in the election, you should generally vote, as nearly as possible, for half of the candidates. In a two-candidate contest for one office, you should vote for one. In a three-candidate contest for one office, votes for one or two candidates are equally effective. Your decision to vote for one or two candidates

should be determined by whether you perceive your first choice to be much better than the other two, or your first two choices to be much better than the third.

In a four-candidate contest for one office, a vote for your top two choices will generally have the greatest influence on the outcome. However, if you believe your first-choice candidate is much better qualified than the other three, you may choose to vote for only one. Similarly, if you believe each of your first three choices is much better qualified than your last choice, you may choose to vote for three.

IEEE's continuing success depends on the quality of the leaders elected by its members. Approval voting gives you greater flexibility to express your views. Please exercise your voting privilege thoughtfully.

HIGHLIGHTS OF PLANS FOR PROGRESS OF THE IEEE

by
Eric E. Sumner
Candidate for 1989 President-Elect of IEEE

As candidate for President-Elect of the IEEE, I want to put before the membership the highlights of the path the IEEE will follow during my term as President.

We have been on this earth a million years, progressing slowly, linearly in knowledge and power. Yet in the last 100 years our capability started to grow exponentially, to literally explode. In a tiny fraction of one percent of our lifetime on this planet, we developed automobiles, motorships, airplanes, spaceships, electricity, electronics, computers, telephones, television, communications networks, photonics, modern medicine and drugs, and on and on. We stand on the threshold of creating new life forms.

The results of all this, especially communications, computing and transportation, have been to largely wipe out geographic monopolies and turn this earth's economy into a *global village.* Geographic monopolies are vanishing, and enterprises all over the world face ten times or greater numbers of competitors. This means both opportunities and danger. In the long run, only those at the forefront of technology and productiveness will prosper. We all must get better just to stand still.

TECHNOLOGY

IEEE has a clear role to keep its members at the forefront. Throughout my career I have actively participated in creating technology and its dissemination in IEEE workshops, conferences and publications. It is absolutely key that we expand these activities and do even better world-wide — as more and more countries contribute to technical progress. I solidly support transnationalism in the technology sphere of IEEE.

Concurrently, to enhance the competitiveness of our members, IEEE must act to enhance secondary schools, which in many countries give an insufficient grounding in math and science; in that endeavor it must join with the other professional societies. Similarly, IEEE must be a catalyst in linking universities and industry to improve higher education. Finally, it must raise the consciousness of employers, to allow, indeed to insist on, a program of continuing education — which is, of course, one of IEEE's primary functions.

QUALITY OF WORK LIFE/PROFESSIONAL ACTIVITIES

Beyond the technical functions, IEEE must actively improve the quality of worklife for all its members. Since this often involves government action, work must be done by national boards. In some countries, national societies already exist; if they are not adequately responsive, the IEEE should create National Activity Boards. In the United States I am a member of the United States Activities Board which has a very broad program. I think that we must focus the bulk of our activities on a very few issues, since moving governments and institutions is a very hard task. I have become increasingly concerned with the U.S. pension system. With the average member holding more than four jobs during a professional career, the existing (defined benefit) systems leave many members with totally unsatisfactory retirement income. By the way, vesting is ineffective, as inflation wipes out the effect of the early years. I will focus our energy, together with other professional societies, on creating a fully portable system. This requires no invention; the academic community has it now in the form of TIAA (defined contribution by employer and employee). It should be every profession's right, but the job instability due to growing competition and defense industry cutbacks make it vital that we move now. The professional is increasingly the key member of society's team. In the area of quality of worklife, we must have compensation and working conditions matched to the contributions of our members — professional and management enhancing the productiveness of their joint enterprise. IEEE must carefully collect data to put a spotlight on major weaknesses.

IEEE SERVICES

There is a need to improve and overhaul, where necessary, IEEE services to its members, and do so at reasonable cost. Each basic function must be reviewed, and improvements planned. I will assign the Executive Vice President, who presently has no real job, the major task of critically reviewing and preparing a report and plan for one major function at each Board meeting — completing reviews of all functions in a two-year cycle.

How do I match the job of president? Well, I have been a major technical contributor during forty years as an engineer — and have received patents, awards, Fellow status at IEEE, and membership in the National Academy of Engineering. I have served as a manager in industry (vice-president), in IEEE (Communications Society president, director), and on advisory boards for universities. And in 1990, I will have retired from industry and serve full-time as your president, with your support.

'TIS A PUZZLEMENT

This Quarter's Puzzle

It's summer again and my grass needs cutting. I'm on my back porch gathering up the energy to attack the jungle my yard has become. My neighbor is watering his grass (Why encourage it?) with a reciprocating sprinkler that swings back and forth as it waters — see Figure 1. Sensing the opportunity to avoid the grass a little longer, I came up with this quarter's puzzle: determine the shape of the area watered by a sprinkler of this type.

Figure 2 provides a detailed schematic of the sprinkler head. A typical sprinkler has 18 holes evenly along the curved head. The sprinkler head is 10 inches wide and has an effective radius of 17 inches.

Figure 3 is a side view of the sprinkler. It swings 60 degrees from the vertical in either direction as it waters.

Part A of the puzzle is to describe the shape of the area watered by the sprinkler.

Part B of the puzzle is extra credit — determine the distribution of the water sprayed by the sprinkler given the following additional information:

- The sprinkler swings from +60 degrees to −60 degrees in 20 seconds and pauses for 10 seconds at −60 degrees. It then swings from −60 to +60 degrees in 20 seconds and pauses at +60 degrees for 10 seconds.
- The sprinkler flow rate is 10 gallons per minute.
- The maximum watering range at 60 degrees is 75 yards.
- There is a +/− 10 per cent variability in the velocity of the water as it leaves the holes in the sprinkler head.

Dave Hollinberger
5264 E. 77th Street
Indianapolis, IN 46250

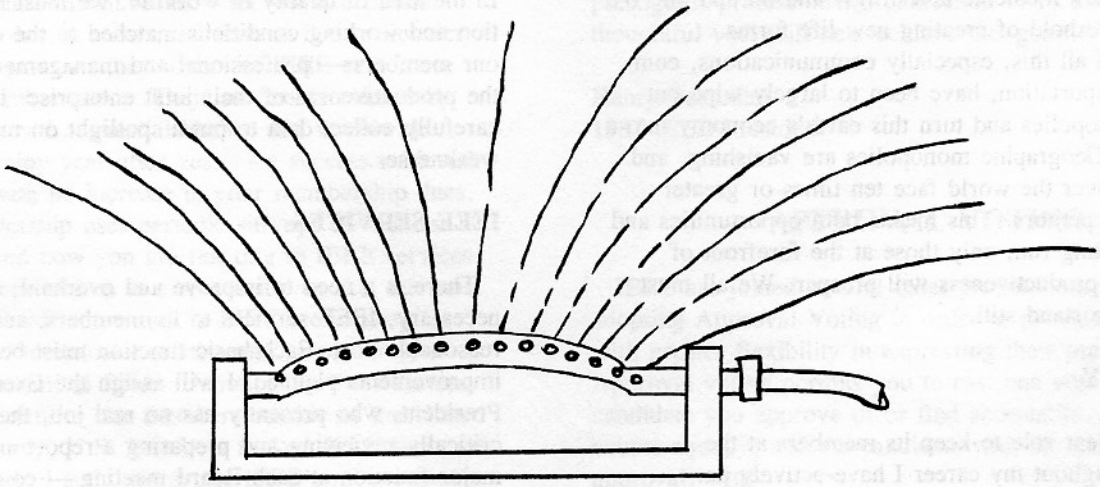

Figure 1. Reciprocating lawn sprinkler: front view

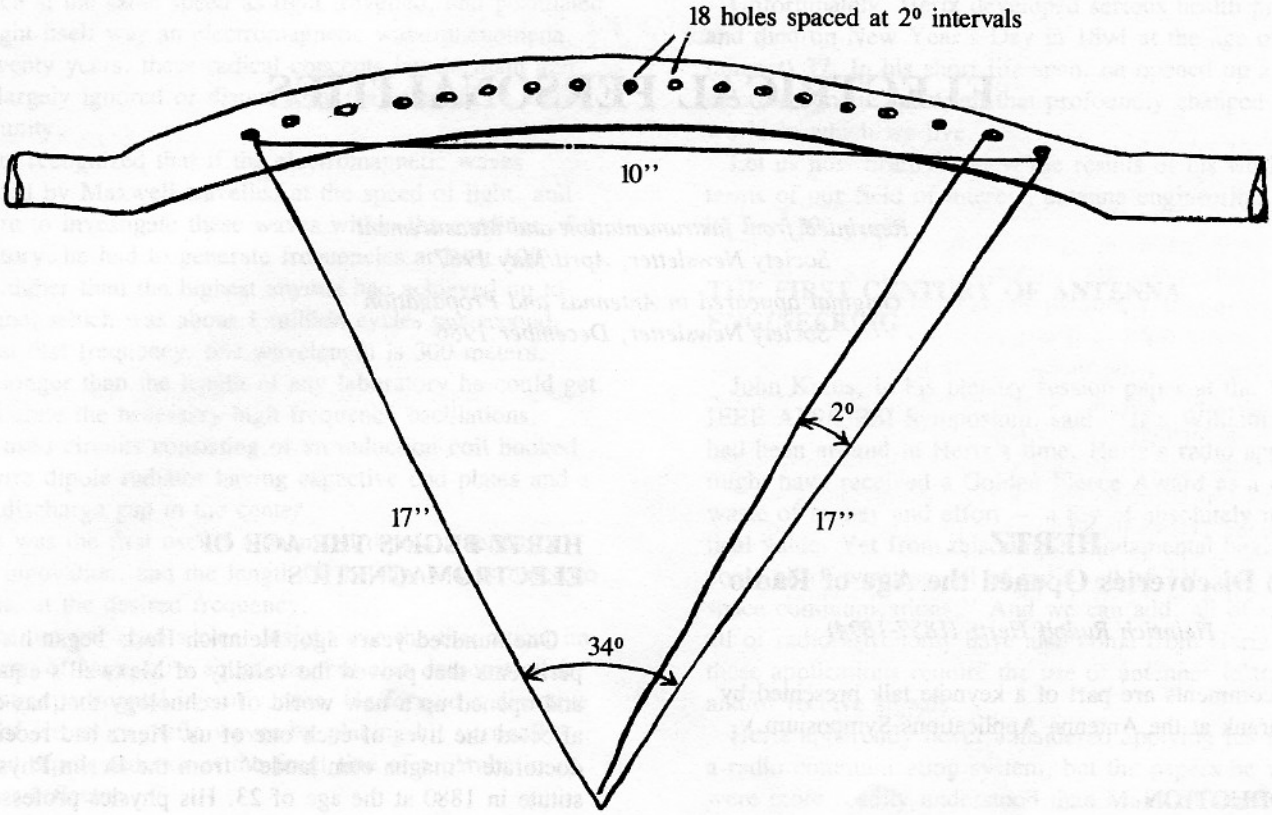

Figure 2. Sprinkler head: detailed view

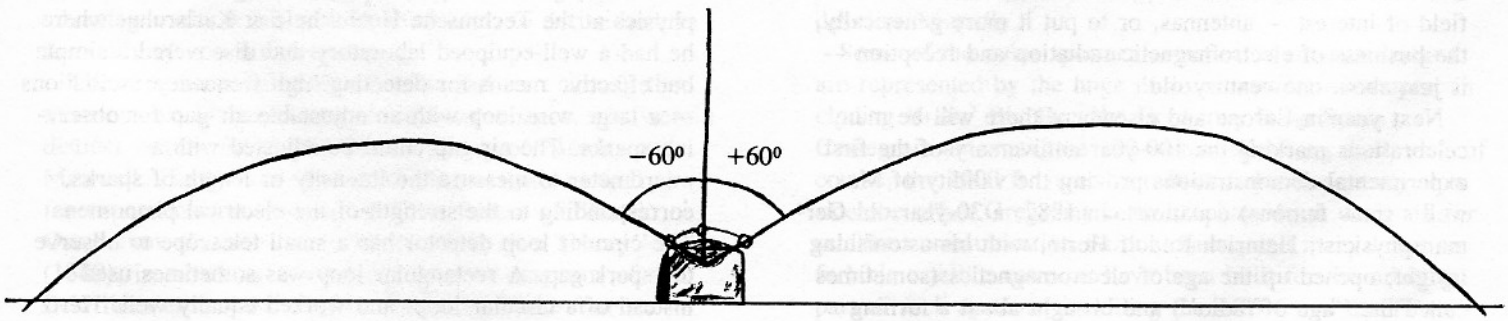

Figure 3. Reciprocating lawn sprinkler: side view

ELECTRICAL PERSONALITIES

Reprinted from Instrumentation and Measurement Society Newsletter, April/May 1987

Original appeared in Antennas and Propagation Society Newsletter, December 1986

HERTZ... His Discoveries Opened the Age of Radio

Heinrich Rudolf Hertz (1857-1894)

(These comments are part of a keynote talk presented by Hal Schrank at the Antenna Applications Symposium.)

INTRODUCTION

Here we are at another "Antenna Applications Symposium", the tenth in this recent series of annual antenna meetings at Allerton Park — preceded by almost 23 similar meetings that were called "Annual Symposium USAF R&D Program." That adds up to 33 such gatherings, which began around 1950 — over a third of a century ago!...

A third of a century! When you say it that way, it sounds like a long time. To some of you here, it represents your entire life so far, and yet some of us senior citizens have been in the antenna business even longer than that. But what is really remarkable to me is the fact that our field of interest — antennas, or to put it more generically, the business of electromagnetic radiation and reception — is just about one century old!

Next year in Europe and elsewhere there will be many celebrations marking the 100-year anniversary of the first experimental demonstrations proving the validity of Maxwell's (now famous) equations. In 1887, a 30-year old German physicist, Heinrich Rudolf Hertz, with his astonishing insight, opened up the age of electromagnetics (sometimes called the "age of radio") and brought about a turning point in world history. As we examine some of his most noteworthy accomplishments later in this talk, we will see that Hertz was truly the first microwave antenna engineer, and all the amazing advancements in antenna technology that have taken place since 1887 have been built on the firm foundation provided by Hertz, the implementer of Maxwell's theory.

HERTZ BEGINS THE AGE OF ELECTROMAGNETICS

One hundred years ago, Heinrich Hertz began his experiments that proved the validity of Maxwell's equations, and opened up a new world of technology that has directly affected the lives of each one of us. Hertz had received his doctorate "magna cum laude" from the Berlin Physical Institute in 1880 at the age of 23. His physics professor, Herman von Helmholtz, was the first on the European continent to study Maxwell's works and to appreciate their significance. Helmholtz tried to influence Hertz to investigate the validity of Maxwell's theory in 1879, the year before Hertz graduated from the Berlin Academy, but Hertz declined. One of the reasons he declined was the lack of a detector for high frequency oscillations, which Hertz knew would be necessary for investigating phenomena involving fractions of a millionth of a second. Galvanometers and other physical instruments available at that time were useless for high frequency observations or measurements.

In 1885, Hertz accepted a position as professor of physics at the Technische Hochschule at Karlsruhe, where he had a well-equipped laboratory and discovered a simple but effective means for detecting high frequency oscillations — a large wire loop with an adjustable air-gap for observing sparks. The air-gap could be adjusted with a micrometer to measure the intensity or length of sparks, corresponding to the strength of the electrical phenomena. The circular loop detector has a small telescope to observe the spark gap. A rectangular loop was sometimes used instead of a circular loop, and worked equally well. Hertz now felt he could proceed with the investigation of Maxwell's theories.

It must be remembered that when Hertz began his experiments, twenty years had passed since the publication of Maxwell's equations. Few people understood Maxwell's mathematics and fewer still appreciated its significance. Maxwell had essentially expressed the electric and magnetic

fields in the space (or dielectric) around the conductors, and included the concept of a displacement current, which ran contrary to most contemporary electrical theories. Maxwell also predicted that electromagnetic waves propagated in space at the same speed as light travelled, and postulated that light itself was an electromagnetic wave phenomena. For twenty years, these radical concepts lay dormant and were largely ignored or disputed by the scientific community.

Hertz recognized that if the electromagnetic waves predicted by Maxwell travelled at the speed of light, and he were to investigate these waves within the confines of a laboratory, he had to generate frequencies at least 100 times higher than the highest anyone had achieved up to that time, which was about 1 million cycles per second. Even at that frequency, one wavelength is 300 meters, much longer than the length of any laboratory he could get. To generate the necessary high frequency oscillations, Hertz used circuits consisting of an induction coil hooked to a wire dipole radiator having capactive end plates and a spark discharge gap in the center.

This was the first use of a balanced dipole antenna, a Hertz innovation, and the length of the dipole was tuned to resonate at the desired frequency.

Hertz not only had a clear insight into the theoretical implications of Maxwell's equations, but also demonstrated brilliant experimental inventiveness. He formed a directive beam of electromagnetic waves by placing his vertically-oriented dipole radiator at the focal line of a parabolic cylinder reflector.

With this and other apparatus, Hertz, operating with wavelengths as short as 25 cm, demonstrated that electromagnetic waves were polarized, and could be reflected and refracted just like light waves. Hertz summarized his experiments in a paper "On Electric Radiation" which appeared in December 1888: "We have applied the term rays of electric force to the phenomena which we have investigated. We may perhaps further designate them as rays of light of very great wavelength. The experiments described appear to me, at any rate, eminently adapted to remove any doubt as to the identity of light, radiant heat and electromagnetic wave motion. I believe that from now on we shall have greater confidence in making use of the advantages which this identity enables us to derive both in the study of optics and electricity."

The experiments that Hertz conducted were among the most notable in the history of electrical science, and were a distinct victory for the field-force theory of Faraday and Maxwell. Hertz showed his skills for analysis as well as for experiments in a paper on "The Forces of Electric Oscillations Treated According to Maxwell's Theory" (1889), in which he constructed the four diagrams of the field lines around a sparkgap oscillator. These four successive diagrams show the radiation of electromagnetic energy through space at four instants of time spaced at quarter-cycle intervals: T=0, ¼T, ½T, and ¾T. The formation of the radiated fields is clearly depicted.

Convinced of the correctness of Maxwell's theory, Hertz set about to interpret and simplify Maxwell's "Treatise". He and the British electrical engineer, Oliver Heaviside, were the first to change Maxwell's equations into the form that is now found in most textbooks. Hertz published his papers on electricity in a book, "Electric Waves" [1], which is a model of clarity and thoroughness.

Unfortunately, Hertz developed serious health problems and died on New Year's Day in 1894 at the age of (almost) 37. In his short life span, he opened up a new electromagnetic spectrum that profoundly changed the world in which we live.

Let us now briefly review the results of his work in terms of our field of interest, antenna engineering, during its first 100 years.

THE FIRST CENTURY OF ANTENNA ENGINEERING

John Kraus, in his plenary session paper at the 1985 IEEE APS/URSI Symposium, said, "If a William Proxmire had been around in Hertz's time, Hertz's radio apparatus might have received a Golden Fleece Award as a complete waste of money and effort — a toy of absolutely no practical value. Yet from this simple fundamental beginning has come all of wireless, all of radio, all of TV, and all of space communications." And we can add, all of radar and all of radio astronomy have also come from Hertz. And all these applications require the use of antennas to transmit and/or receive signals.

Hertz apparently never considered applying his results to a radio communication system, but the papers he wrote were more readily understood than Maxwell's and therefore stimulated others to do so. One of these was Marconi, who at the age of 20 happened to read a magazine article describing Hertz's experiments, while on a summer vacation in the Alps. Young Marconi became obsessed with the idea of using radio waves to send messages without wires. He cut short his vacation, rushed home to try the idea, and the rest is history.

Early antennas were made of wires, appropriate for the lower frequencies used in those days. In the 1930's, with the development of radar and microwave technology, antennas soon took the form of reflectors, lenses, and other derivatives of optical devices. Array antennas soon followed, and antenna technology as we now know it developed rapidly.

Some of the more spectacular reflector antenna designs are represented by the huge radio astronomy telescopes, including Kraus' Big Ear, the Goldstone Deep Space Cassegrain antennas, the 100 meter Effelsberg dish, and, of course, the 1000 ft. Arecibo reflector. More recently, low sidelobe offset Gregorian reflectors have been designed for satellite communication Earth stations, and many large unfurlable satellite antennas have been built for the orbiting part of such systems, including the ATS-6 and the TDRSS antennas, for examples.

Array antennas are also too numerous to mention except for some notable examples, including the AN/FPS-85 USAF Spacetract antennas, the huge arrays for the Pave Paws and Cobra Dane radar systems, and, perhaps the most impressive array of all, the VLA (Very Large Array) of 27 eighty-four-foot dishes for radio astronomy in

Socorro, New Mexico. Not nearly as impressive, but of importance for future airborne systems, are the conformal (non-planar) arrays being developed, including cylindrical, conical and spherical examples.

Lens antennas have not been as popular in recent years, but notable exceptions are the multiple beam lens antennas used in DSCS-III (Defense Satellite Communication System).

A complete discussion of the thousands of diverse antennas that have been invented, designed, and used in this first century since Hertz would take many days or even months to cover. Just look at this symposium — we are about to devote two and a half days to a review of some three dozen antenna papers, and by the time this year ends, there will have been at least four other symposia devoted to antennas and related electromagnetic topics in this country alone. We are all part of a great scientific and technological community, building a body of knowledge on the foundations given to us by Faraday, Maxwell, Hertz, Marconi, and many other contributors, some of whom are still alive and active today.

THE CHALLENGES AHEAD

The challenges ahead for antenna engineers, scientists, and educators are as diverse and exciting as they were 100 years ago. Antennas for spacebased radar, global and interplanetary communications, the space station, strategic defense initiative, a lunar colony, a manned mission to Mars — all present opportunities for innovative design. We need smarter antennas, with the ability to adapt instantly to changes in mission or environmental conditions. We need active arrays that generate coherent RF power in each element with high efficiency to minimize heat generation. A remotely controlled radio telescope on the moon could gather data from the farthest corners of our universe and relay the pre-processed images to laboratories here on Earth.

When the attendees of the Allerton symposia of the next century look back at our 1986 meeting, I'm sure they'll find a number of notable contributors to their successes among our generation. Who knows, we may have another Heinrich Hertz right here in this distinguished group!

REFERENCES

1. Translated into English by D. E. Jones and published in 1893 by Macmillan & Co., London. Reprinted in 1962 by Dover Publications, New York.
2. Kraus, John D., *Antennas Since Hertz and Marconi,* IEEE Transactions AP-33, No. 2, Bef. 1985, pp. 131-137.
3. Bordeau, S. T., *Volts to Hertz, the Rise to Electricity,* Burgess Publishing Co., Minneapolis, MN.

CORRESPONDENCE

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Dearborn, MI 48126

Dr. Harold A. Sabbagh
Sabbagh Assoc., Inc.
4639 Morningside Drive
Bloomington, IN 47401

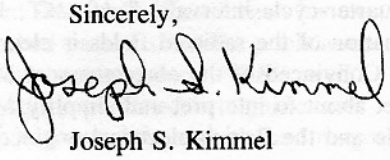
Dear Dr. Sabbagh:

As a member of the IEEE Oceanic Engineering Society, I came across your name at the back of the latest issue of the OES Newsletter. I am currently an electrical engineering student at the University of Michigan-Dearborn, with four courses to complete before receiving a BSEE degree. As I have a great interest with the oceans, I am hoping to find a job which directly relates to furthering our understanding of the oceans.

Without wishing to burden you, I would like to know if you are aware of any institutions which have need of employees fresh out of school, whether it be where you are employed, or somewhere else. If so, would it be possible to send me the addresses of any such companies as well as the person to whom I should address myself if known? I certainly understand if this request cannot be met.

Thank you in advance for your cooperation.

Sincerely,



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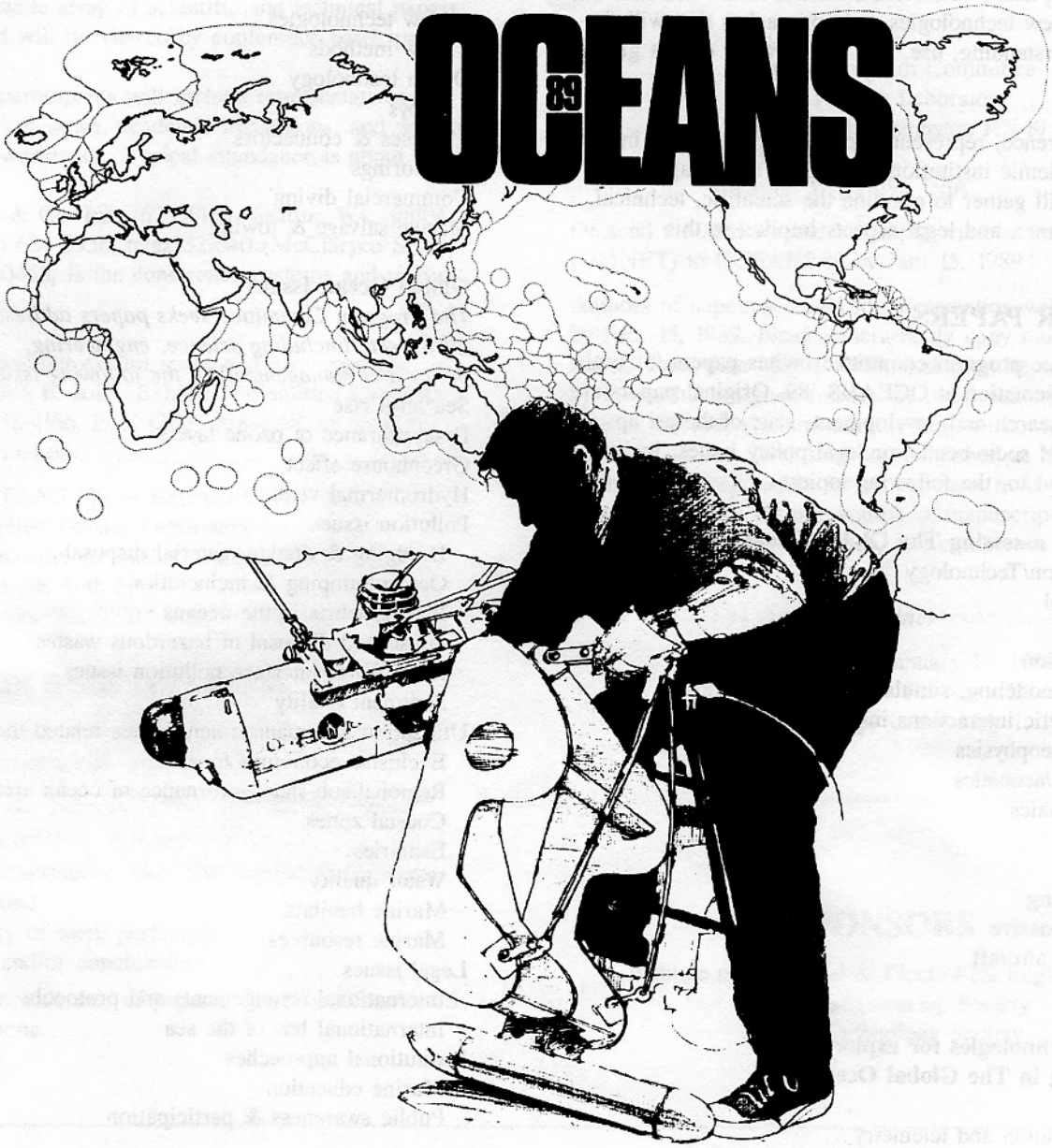
Call for Papers & Exhibits



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As the last decade of the 20th Century begins, the international marine community stands ready to confront earth's last frontier — the global ocean. Drawn together by this common resource and the essential role it plays in the future of the planet, both inland states and maritime nations are seeking new technologies and approaches that will further the understanding, use, and preservation of this great resource.

At this conference, representatives of marine related industries, academic institutions, and government agencies worldwide will gather to examine the scientific, technical, social, economic, and legal aspects implicit in this challenge.

CALL FOR PAPERS

The conference program committee invites papers for oral or poster presentation at OCEANS '89. Original papers are sought on research and development, state-of-the-art applications, and socio-economic/legal/policy issues, including but not limited to, the following topics:

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Instrumentation/Technology
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Data acquisition
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Geology & geophysics
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Acoustics
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- Autonomous

Marine science research
- New technologies
- New methods

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- Buoys
- Cables & connectors
- Moorings

Commercial diving
Marine salvage & towing

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The Program Committee seeks papers addressing all aspects (including science, engineering, policy and management) of the following issues:

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Greenhouse effect
Hydrothermal vents
Pollution issues
- Dredging & dredge material disposal
- Ocean dumping & incineration
- Plastic debris in the oceans
- Subseabed disposal of hazardous wastes
- Land/Water interface pollution issues
- Sediment quality

Utilization and management issues related to
- Exclusive economic zones
- Regional/sub-state governance of ocean areas
- Coastal zones
- Estuaries
- Water quality
- Marine habitats
- Marine resources

Legal issues
- International arrangements and protocols
- International law of the sea

Institutional approaches
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- Public awareness & participation

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Manufacturers of ocean engineering products and firms offering related services are invited to exhibit products and services throughout this conference. These exhibits will complement a wide array of scientific and technical papers and panels, and will be viewed by conference participants.

OCEANS '89 participants will include representatives of marine related industries, academic institutions, and government agencies worldwide. Typical attendance is about 1,000.

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If you wish to present a paper or poster display, please prepare the following materials:

1. An abstract that does not exceed 300 words. Please structure the abstract in three sections:
   - Problems/questions addressed, including historical background
   - Summary of work performed
   - Results and/or conclusions

   Be sure to include title of paper and author(s) name, address, telephone.
2. A brief biographical sketch of the author(s)

Mail the abstract and biographical sketch(es) to the Technical Program Committee at the address below before the deadline which is Jan. 15, 1989.

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Or send the abstract and biography via electronic mail (OMNET) to OCEANS.89 by Jan. 15, 1989.

Authors of papers selected for presentation will be notified by Feb. 15, 1989. Final camera-ready copy must be submitted not later than May 1, 1989, and must be accompanied by the author's signed release for publication in the Conference Record. Authors are advised that conference proceedings will be conducted and published in English. Authors are responsible for all expenses incurred, including time spent, costs for preparation of manuscripts and illustrations, travel to the conference, and conference registration fees.

Deadlines

Abstracts due • January 15, 1989
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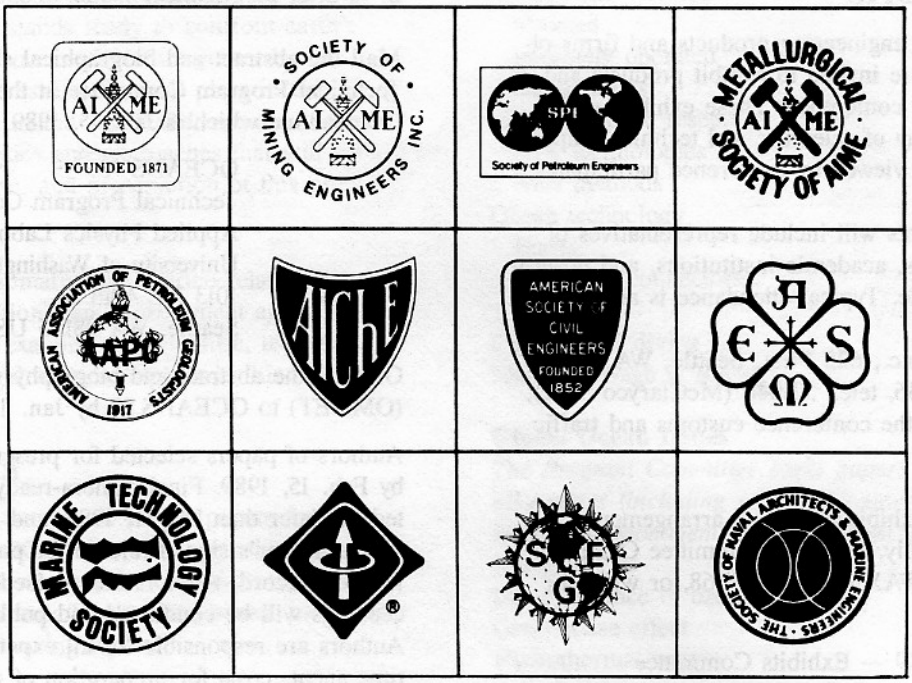

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All Sponsoring Societies of the Offshore Technology Conference will participate in developing the technical program for the 1989 Conference. The Program Chairman for the 1989 Conference is Joe Key.

Individuals interested in submitting an abstract for consideration by the 1989 Conference Program Committee should review carefully the material included in this document. Specifically, potential authors should note that a **manuscript will be required for inclusion in the *Proceedings* Volume for each paper accepted for the 1989 Conference Program.**

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OTC provides complimentary registration **only** for presenting authors who register on special author registration cards. OTC assumes no obligation for any other expenses incurred by authors for travel, lodging, food, or other incidental expenses.

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Please type and limit abstract to this page only

Solicitation of technical papers for the 1989 Conference will be made primarily with this Abstract Submission Form. The form contains space for the abstract that must be included for all proposed papers. This system permits the selection of papers for the program before manuscripts are written. Additional copies of this form will be supplied by the OTC Headquarters on request.

ABSTRACT: An abstract, containing 200–300 words, must be provided. Develop the abstract by separately addressing the four parts in the space provided on the form. The individual parts are described below.

Description of the Paper: Summarize the scope and nature of the work upon which the paper will be based. Note the relative emphasis of components such as field data, laboratory data, design, analysis, field operations, research, or system development. Note differences from other past or current related work being done in this area. If the paper is a review paper, carefully state the extent of the coverage.

Application: Describe the possible application of knowledge provided in this paper to a particular area of offshore resource development and recovery. If the paper is a review paper, carefully state the extent of the coverage.

Results, Observations, Conclusions: Describe results to be presented in the paper and state specific conclusions of work. Describe how these differ from results or conclusions of previous work in the same or similar subject. If the paper describes hardware, or operation of a system, or describes an event, state specific new information revealed. Also state whether or not results of field data, laboratory test data or calculated computer work will be included in the paper.

Significance of Subject Matter: Briefly state the most significant aspect of the subject matter.

Subject categories are listed below. Please indicate by number the most appropriate Primary Category designation on the abstract form where indicated. A secondary category is optional.

1. Marine Geology & Geochemistry
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EVALUATION OF ABSTRACTS BY THE 1989 PROGRAM COMMITTEE

The following criteria will be observed by the Offshore Technology Conference Program Committee in selecting papers for the 1989 Conference.

1. The paper must not have had prior extensive publication or circulation. Publication in trade periodicals or other professional and technical journals will be considered extensive publication.

2. The paper should contain new knowledge or experience in some field of offshore resource and environment.

3. The paper must be technically correct and should be of interest to a reasonable number of people working in the field of offshore resources and environment. It may be theoretical or may present the results of laboratory studies, and it may state or analyze a problem. The paper may also be a review-type paper, but must be of significant value to the technical field.

4. The paper may present information about equipment and tools to be used in offshore technology. Such papers must show the definite applications and limitations of such equipment and should avoid undue commercialism and the extensive use of trade names.

5. **The abstract should have necessary clearance before submittal to OTC Headquarters. Prospective authors should provide information on any clearance problems when the abstract is submitted.**

Although theoretical papers will be selected in various fields, application papers presenting solutions to problems are also desired. Program time is limited, so the Program Committee will emphasize the quality of the contribution and its value in the field of offshore technology.

A WORD ABOUT COMMERCIALISM . . .

The OTC Program Committee has a stated policy against use of commercial trade names, company names, or language that is **commercial** in tone in paper titles, figures, and slides and should be avoided in the text. Use of such terms will result in **careful scrutiny** by the program Committee in evaluating abstracts, and the presence of **commercialism** in the text of papers submitted for the *Proceedings* Volume is cause for removal of the paper from the program.

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Authors of papers selected for the 1989 OTC program will be notified by mail in December 1988.

Authors offering papers for the program should fully understand that a manuscript will be required for each technical paper selected for the 1989 Conference. If selected, the manuscript will be printed in the *Proceedings* Volume to be sold at the Conference. The maximum desirable length for any paper is about 7,000 words.

Complete instructions on preparation of manuscripts and slides will be sent to authors of accepted papers.

Final manuscripts are due **February 10, 1989**, where author types the final copy of his/her manuscript on special forms provided by the OTC Office, then sends typed forms and loose illustrations to OTC Headquarters. The OTC staff completes the layout and printing of the paper.

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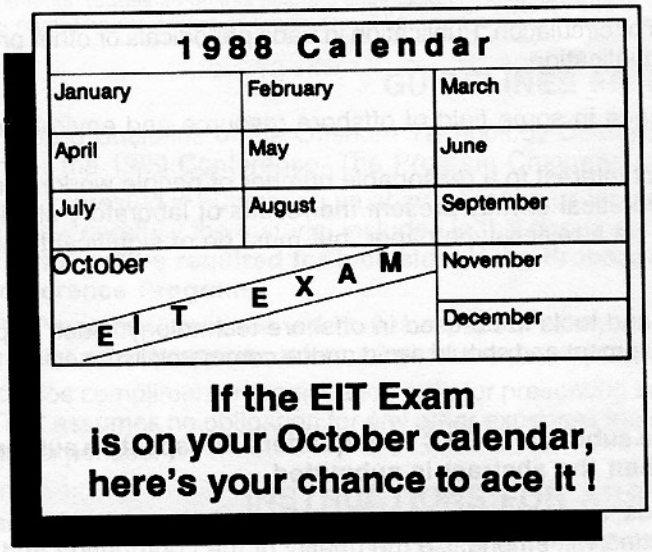

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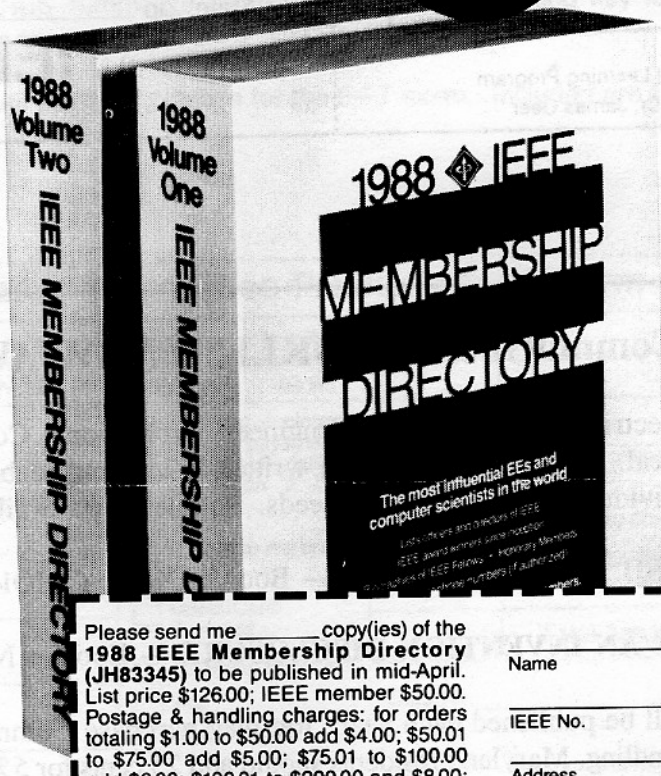

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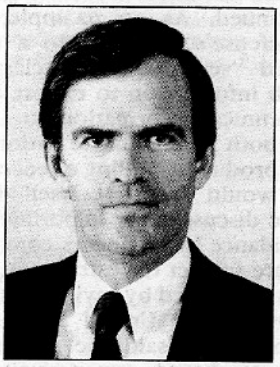

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Vol. 3, No. 9 Joseph A. Edminister, Editor—Catherine S. McGowan, Associate Editor May 1988

Approval Voting—IEEE President-Elect Emerson W. Pugh and other IEEE leaders have issued a statement explaining the new approval voting process IEEE will use for electing member-chosen officials. Following is the statement in its entirety:

IEEE has joined several other professional societies in adopting approval voting, in order to provide members with greater flexibility in expressing their preferences. Approval voting permits you to cast one vote for each candidate you approve of or find acceptable. Each vote counts equally, and the candidate with the most votes wins.

If you approve of all candidates, you may vote for all. If you approve of none, you can vote for none. A vote for all or none of the candidates may express your view, but it will not affect the outcome of the election.

To have the greatest influence in the election, you should generally vote, as nearly as possible, for half of the candidates. In a two-candidate contest for one office, you should vote for one. In a three-candidate contest for one office, votes for one or two candidates are equally effective. Your decision to vote for one or two candidates should be determined by whether you perceive your first choice to be much better than the other two, or your first two choices may be much better than the third.

In a four-candidate contest for one office, a vote for your top two choices will generally have the greatest influence on the outcome. However, if you believe your first-choice candidate is much better qualified than the other three, you may choose to vote for only one. Similarly, if you believe each of your first three choices is much better qualified than your fourth choice, you may choose to vote for three.

IEEE's continuing success depends on the quality of the leaders elected by its members. Approval voting gives you greater flexibility to express your views. Please exercise your voting privilege thoughtfully.

USAB Chairman Edward C. Bertnolli explains the approval voting concept in detail in the June 1988 issue of "Professional Perspective," USAB's insert in *The Institute*.

Education Incentives—In a letter to Senate Finance Committee Chairman Lloyd Bentsen (D-Texas), USAB's Continuing Engineering Education Committee urged full Senate support of permanent, retroactive reinstatement of Section 127 of the Internal Revenue Code, which expired in December 1987. The Committee wrote that "IEEE's United States Activities Board is confident that the members of the Senate Finance Committee are well aware of the need to provide incentives for the employees of business and industry to keep abreast of the latest technologies. Only with highly skilled workers will the United States be able to maintain (and in some cases regain) a competitive edge in the world."

Section 127 provided tax-free status to employee educational assistance. Congress is considering alternative means of providing incentives (e.g., tax credits, vouchers) for employees of business and industry to pursue continuing education, but none have been initiated yet. Therefore, "IEEE-USAB feels that retroactive reinstatement of Section 127 of the Internal Revenue Code is imperative," the Committee said. "A hiatus of even a year or two without these incentives will result in a further loss of the country's already tenuous grasp on world leadership in science and technology . . . This loss of momentum in individual educational programs will be difficult to recapture."

Information Protection—IEEE's Committee on Communications and Information Policy (CCIP) and USAB's Technology Transfer Committee sent a letter in April to Sen. Patrick Leahy (D-Vermont), Chairman of the Subcommittee on Technology and the Law, to express IEEE views on U.S. information policy and competitiveness. They told Sen. Leahy that IEEE supports the use of classification "when necessitated by national security concerns," but IEEE generally resists attempts to restrict the exchange of unclassified technical information.

"IEEE is very concerned about recent government attempts to restrict important technical information to U.S. citizens only," they continued. As an example, they cited the Department of Defense's attention to a new category of information termed "sensitive but unclassified," saying it would subject such information to export control. "We feel that restricting technical information to U.S. citizens only would do harm to both IEEE and U.S. national interests. Such restrictions would produce a chilling effect on the engineering community that would manifest itself in two ways: a reduction in public discussion of important high technology issues; and an avoidance by engineers committed to publication of areas that are subject to restrictions."

The Committees concluded by saying that IEEE has pointed out the dependence of the United States upon sources of foreign information. They said the success of the United States has not been based on exclusivity of technical knowledge in developing useful products, services or weapons. "IEEE, as one of the largest contributors to the commercial and military strength of the United States, believes our country would surely suffer under restrictions."

Age Discrimination—USAB's Age Discrimination Committee submitted a statement to Rep. Matthew B. Martinez (D-California), Chairman of the House Education and Labor Committee's Subcommittee on Employment Opportunities, to tell of concerns of IEEE U.S. members about the 1987 rule by the Equal Employment Opportunities Commission to permit unsupervised waivers of employee rights under the Age Discrimination in Employment Act.

"Since technology moves at such a rapid pace," they wrote, "older engineers are often victims of the stereotype that their knowledge is outdated and their experience is not relevant to state-of-the-art research. Thus, engineers have always been particularly hard hit by age discrimination in employment."

On behalf of USAB, the Committee commended the House Subcommittee on Employment Opportunities for holding public hearings on this issue and offered IEEE's assistance in matters relating to employment.

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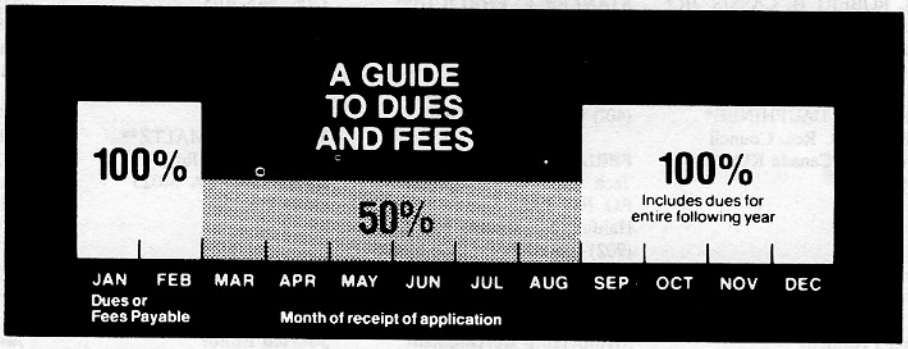

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