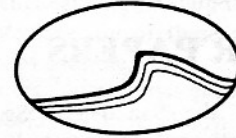


IEEE COUNCIL ON



OCEANIC ENGINEERING NEWSLETTER



EDITOR: HAROLD A. SABBAGH

ISSUE NO. 15—DECEMBER 1978



PRESIDENT'S COMMENTS

OCEANS 78 was a very successful conference and a "big thank you" to all who participated and attended and made the conference such an outstanding success!

Several hundred papers have been reviewed for the Offshore Technology Conference for 1979 and I know its going to be an even better conference than those we've had in the past. OCEANS 79 is progressing nicely and the CALL FOR PAPERS is about ready to go out.

I am happy to announce that Dr. Harb Hayre has been appointed a representative to the Council for the Antennas and Propagation Society. Twenty-two people attended the Council meeting held September 6, 1978 in conjunction with OCEANS 78 and they represented 12 of our 18 Group and Societies which make up the Council. It is a concern that not all of the Groups and Societies are represented. A new procedure is being instituted which will identify those Groups and Societies which are actively supporting the Council and they will be recognized as such in the distribution of future surplus funds.

There are a number of opportunities for participation and I would like to draw some of those to your attention; if any of you are interested please contact me or the appropriate Committee Chairman and forward a brief statement of your background. Harold Sabbagh could use news items for the Newsletter and that is a function that all of us can perform in furnishing items that are of broad general interest.

An Education Committee has been formed, chaired by Art Westneat; this committee is going to be considering a number of different short courses and various education type functions that might be of interest to the Ocean community. I know that Art would welcome helping hands from those of you that have expertise in this area. One of the exciting areas for the future is sponsoring awards at the Science Fair; these would be both at the Regional and International level. It offers a tremendous opportunity to reach the youth and to build a long term stable base of interest in the Ocean affairs. I am convinced that the only way that we are going to get the interest we need to support the Ocean Engineering function is to establish a broad political base and a broad base of technical interest. I believe that one very effective way to do this is through the Science Fairs because we will be reaching the youth who will be the leaders of tomorrow. We will not only affect those who directly participate, but thousands of others who will attend the fairs as observers. Meetings have been held with the Science News people and they have provided us with information as to the type of brochures that we might put together. It will not be possible to have something prepared for the 1979 Fair but I am hopeful that we can have something for 1980. Those of you who have special interest in this committee, please contact me.

*Lloyd Z. Maudlin
President IEEE/COE*

OCEANS '79

CALL FOR PAPERS

The IEEE and the San Diego Section of the Marine Technology Society are inviting technical papers for OCEANS '79 which is to be held at the Town and Country Convention Center in San Diego, CA on Sept. 17-19, 1979. Dr. Howard Blood, Technical Director, Naval Ocean Systems Center (NOSC), is General Chairman with Dr. William Nierenberg, Director of Scripps Institution of Oceanography chairing the technical program for OCEANS '79. The theme for OCEANS '79 is "*The Technical Challenge of Innerspace*."

All selected papers are to be presented by the authors and will be published in the technical proceedings to be distributed at the conference.

Papers are solicited that give emphasis to the *Technical Challenge of Inner Space*. A listing of suggested topic areas is as follows:

- Advanced Surface Vessels
- Antennas and Propagation
- Buoy Systems
- Cables and Connectors
- Communications and Telemetry
- Computer Applications
- Diving Technology
- Economics of Ocean Developments
- Educational Programs
- Fisheries
- Geodesy
- Ice and Arctic Engineering
- Instrumentation
- Marine Materials
- Marine Zoology
- Naval Architecture
- Navigation Systems
- Ocean Energy
- Ocean Mining and Resources
- Oceanic Information Systems
- Offshore Exploration and Structures
- Power Systems

- Seafloor Engineering
- Support Engineering
- Technical Aspects of Ocean Policy
- Undersea Vehicles
- Underwater Acoustics
- Underwater Vision Systems
- Water Pollution and Marine Ecology

Papers which address technical areas not covered by the listing will be given equal consideration. It is required that each author prepare and submit an abstract of about 400 words. It should be sufficiently complete to permit the evaluation and selection of papers by the technical programs committee. The abstract should be submitted no later than February 1, 1979 to:

OCEANS '79
Technical Program Chairman
3559 Kenyon Street
San Diego, CA 92110

Authors of papers selected will be notified by mail. Authors will not be reimbursed for time or expenses incurred in preparing manuscripts and illustrations. Expenses for travel to and during the conference are the authors obligation.

EXHIBITS

An extensive exhibit of marine products and related services is planned as part of OCEANS '79. The technical exhibits will demonstrate the state-of-the-art of Marine Technology to the expected 1200 attendees. For additional information please contact:

OCEANS '79
Exhibit Chairman
4455 Monico
San Diego, CA 92107



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FEATURED SPEAKERS AT OCEANS '78

Juanita M. Kreps, Secretary of Commerce, and Cecil D. Andrus, Secretary of Interior, were the featured speakers at OCEANS '78. Their remarks are reprinted here for the benefit of those who were unable to attend the conference. They reflect the growing realization that there is a need for close cooperation between scientists and government decision makers, throughout the international community, for the effective utilization of the oceans.



Juanita M. Kreps, Secretary, U. S. Department of Commerce. Her address delivered at OCEANS '78 follows.

I am pleased to be here for the Oceans '78 meeting of the Marine Technology Society. Your program indicates that you will be addressing a wide range of topics: undersea technology, ocean engineering, coastal zone management. These are complex issues; they pose problems that will not be solved easily. Yet further postponement of such questions is clearly unacceptable.

The ocean has had great influence on the life and culture of this nation. Our forefathers depended on the sea for food, transportation and security. The sea has given us important aspects of our romantic culture and lore. We still look back with fondness at the eras of the Yankee clippers, the New England whalers, and the salty fishermen who went down to the sea in ships.

Today's challenges are different. Small coastal settlements of colonial times have become our great cities. The tall ships have given away to modern tankers and freighters. Whales are now endangered, and while fishermen still go down to the sea in ships, their ships are not the fishermen's dorys of the past but modern trawlers capable of netting thousands of tons of fish on a single voyage.

As a result, the importance of the ocean has grown, and its resources promise even greater value to the future.

Consider the riches the ocean holds.

Two-thirds of the recoverable reserves of oil and natural gas in the United States lie in the ocean under the Outer Continental Shelf and coastal margins of Alaska.

More than 10 billion tons of nodules containing nickel, cobalt, copper, and manganese are thought to lie on the floor of the deep. More extensive use of these materials will be necessary as land supplies dwindle.

American coastal waters and estuaries are the most productive fisheries in the world, yielding almost one-fifth of the world's harvestable supply. Commercial fishing contributes nearly \$4 billion in processed fish valued at wholesale prices and provides hundreds of thousands of man-years of employment.

The ocean is a great natural transportation resource. More than \$63 billion of oceanborne commerce moved through U.S. ports in 1976. In fact, almost all of our commerce with international trading partners moves over the sea lanes and through port facilities.

In addition, the ocean's edge—the coastal zone—is an important industrial, residential and recreational resource. Nearly half the nation's industrial jobs are located in coastal counties, where 42 percent of our population lives and plays.

Finally, seawater itself may become an important source of energy in the future. Developments in fusion technology hold promise for creating the sun's energy under controlled conditions within 20 to 30 years. If this proves practicable, the waters of the ocean will be the source of the heavy hydrogen atoms needed as fuel for the process.

Although the ocean contains this vast store of resources, we are currently using but a fraction of its potential. This oldest and most used of our resources is, therefore, in a sense our "last frontier." We know far more about the physics, dynamics, and the atmosphere of outer space where few people have been than we know about the oceans which man has traversed for centuries.

Back in the 1960s, the ocean was seen as a cornucopia of riches. Its fisheries, we were told, would provide the world with a bountiful source of protein. Oil and gas would flow in limitless supply.

We have since learned that ocean development is not so simple, that the ocean is not infinite, and that fish and other living resources can be damaged by man's avarice and carelessness. We have learned too that, while oil and natural gas exist in large quantities in the continental shelf and beyond, they are not easy to find nor inexpensive to produce.

These have been useful lessons, but they have also greatly reduced our enthusiasm and our vision. It is now time to rekindle this enthusiasm and begin looking again at the ocean as a focus for national economic development.

This development must be viewed realistically, with full understanding of the constraints we face. As demand for the ocean's resources increases, the technology for tapping those resources will develop. That has been the historical pattern. Already oil and gas demand has spurred advances in American offshore petroleum technology. Demand for gas has brought great strides in LNG tanker technology. Demand for new material supplies is similarly producing technological innovation in ocean mining.

But if we are to develop our ocean resources in an orderly manner, it will require a joint effort—a partnership between government and the private sector.

Government must ensure that the nation's economic and regulatory climate is conducive to orderly development. This means reducing the unpredictability of regulations that increase risks and discourage investment. It means encouraging industrial innovation in the private sector. In some instances, it may mean direct participation in technology development

where the prospects for immediate return are too low to attract private capital.

But by and large, government can only create the conditions in which development can take place. It is the private sector which must bear the major financial risks.

And in all this, we must recognize that technology is a double-edged sword. It can both create and destroy. The government's responsibility to foster and promote the development of the ocean is paralleled by its responsibility to conserve and protect the ocean and its resources.

Within the Department of Commerce, we are exploring ways to achieve both objectives by breaking the age-old pattern in which industry "proposes" and government "opposes."

The business community complains that government regulation strangles initiative, that needed capital must be diverted to meet requirements that have no market value, that domestic regulations place American industry at a competitive disadvantage in the world market.

There is truth in some of these allegations. However, if we are to reduce regulatory costs, industry and the government must agree on mutual goals. And we must have a strategy for achieving them.

Toward this end, we are trying some new procedures. The Fisheries Conservation and Management Act created eight Regional Fisheries Councils in 1976 to develop management plans and policies for guiding fishing in our new 200-mile conservation zone. These Councils include representatives of industry and government and are given responsibility for managing fish stocks on a regional basis. It is still too early to judge the effectiveness of the Councils, but they are an example of the sort of innovative approach we need to bring government and industry closer together.

A similar forum is needed to bring industry and government together to advance ocean technology. This council could pool the talents of industry and government to help identify the goals and strategies for future ocean development. Such a dialogue is needed to ensure that the plans of government and industry are consistent with our national goals.

The formulation of government policy is sometimes more complex than the development of the technology it regulates. Seabed mining is an example. American industry now has the ability to mine and process nickel, copper, manganese, and cobalt from the ocean floor under thousands of feet of water. The minerals found on the seabed—particularly manganese and cobalt—are critical to national security. Unless alternative sources are developed, we will, within two decades, be largely dependent upon southern Africa and the Soviet Union for manganese and on Zaire for cobalt. By the year 2000, without a functioning ocean mining industry, the United States may become a captive in a seller's market.

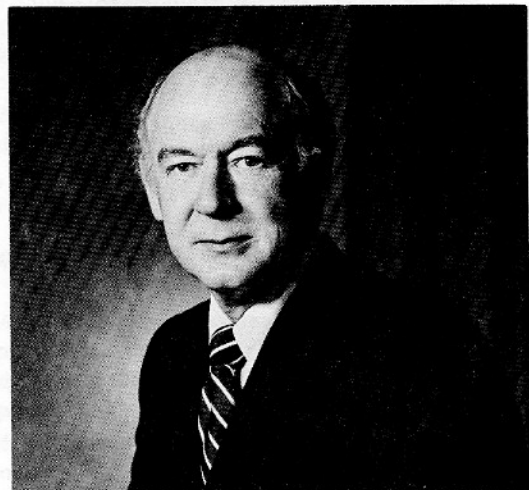
But the financial risks of development are enormous—estimates run as high as \$700 million for a single venture. And a major part of that risk has nothing to do with cost and sales projections but with the fact that until the U.N. Law of the Sea Conference resolves the seabed issue, operating on the high seas means operating without the protection of property rights.

We must resolve the seabed issue if development is to go forward. The legislation now pending in the Congress with minor modifications will provide industry with the stable and secure operating climate it needs until the international questions are resolved.

Though our visions of the ocean's wealth may have peaked in the 1960s, the ocean and its resources probably are more important to us now than then. The question before us now is not whether to develop them but "how." How to bring industry, Government, and the citizenry together to deal with these issues? How to spur marine science and technology? How to blend technology and public policy in a way that will provide at the same time access to resources and protection of the marine environment?

These are the questions that confront you in the ocean community and us in government. Answers must come from all of us working together in an alliance for the ocean. We must be as innovative in solving the policy problems facing ocean use as we are in developing ocean technology. With a touch of impatience, we must then insist that the nation get on with it.

Thank you.



Cecil D. Andrus, Secretary, U. S. Department of Interior. His address delivered at OCEANS '78 follows.

It is an honor for a former governor of a land-locked state, Idaho, to be featured at a meeting on oceans.

Perhaps I should point out, however, that appearances can be deceiving because all the world should be concerned about oceans.

Let me begin by acknowledging the debt that we who must make hard political decisions owe to those of you who provide the scientific research, the data, and the technical advice upon which our decisions are based.

Organizations such as the Marine Technology Society and the IEEE improve the basis upon which intelligent use of the oceans can be made. This Oceans '78 conference is part of a feedback process—a process by which, as we learn more about oceans, we can be wiser and more subtle at making policy on oceans activity.

Oceans '78 brings together technical and policy considerations. This has not been done often enough in the past. Without your input, decisions on ocean policies would be blind guesses at best.

One other observation, should be made. Oceans are great in size, obviously complex, and often hide their secrets well. Too often the oceans have been treated as if they are indestructible. Something as large as an ocean, capable of sustaining great storms and huge creatures, able to maintain the billions upon billions of organisms of countless varieties, should easily support puny man's depredations. But, we know that this is not the case. The oceans can accommodate man, but only to a limit. The oceans may *seem* indestructible but they are—in some respects—quite fragile.

We cannot wish away the incursions man has made and will continue to make on this part of his environment. The need is to assure that our incursions are kept within the limits of necessity and good sense.

The situation on the Klamath River in California demonstrates dramatically the need for cooperation among individuals and among government agencies in protecting marine resources. It also demonstrates our need for greater knowledge.

Fortunately, biologists warned us that the number of chinook salmon making the run up the Klamath River this summer was far below that needed to perpetuate the run of recent years.

Working with the State of California, we took steps to curtail the fishing for fall chinook salmon and steelhead trout in the Klamath River. When and if the biologists tell us that enough fish have returned to spawning grounds to perpetuate a normal population, we will then remove the restrictions.

Several possible reasons for the apparent low numbers of fish have been offered:

One possibility is that the run was delayed or reduced because of some environmental factor in the ocean. Anadromous fish runs on other West Coast rivers reportedly are late or smaller than usual.

Another possibility is that an increase in the ocean harvest of fish this year has reduced the number of fish available to enter the river.

Yet another possibility is the hunger and the number of seals and sea lions.

We have taken emergency measures to deal with an apparent problem this fall. But we obviously need some better data and some more study if we are to make rational adjustments in our programs for the long term.

Many resources in and under the waters of the earth are vital to man's existence. These resources do not exist in isolation, one from another. To reach one, another is disturbed. Often we have different activities going on at the same time, in the same general area, dealing with quite separate resources. These resources have existed together for ages. So also can man's wise use and enjoyment of them continue side by side for the generations to come.

A beneficial relationship of man and environment is not only possible—it is a duty that each generation owes to those that follow.

If the term "multiple use" has any applicability, it must apply to how we look at the resources of the oceans.

In making today's and tomorrow's decisions on ocean matters, there are a large number of claimants. Intelligent multiple use is necessary if we are to protect our oceans while meeting the legitimate needs of society.

Let me emphasize that my concept of "multiple use" does not mean that we try to put every square foot of our earth's

surface or every cubic foot of our oceans to as many uses as possible. "Multiple use" to me means that we carefully study an area of land or water, consider what uses are most beneficial and compatible, and then decide which use or uses should be allowed or encouraged. Some areas may well accommodate a considerable number of uses simultaneously. Other areas may be so fragile, or so special, that they should be severely limited in human usage or development.

Just as I have fought to protect precious ecosystems on shore in Alaska, I know that there are certain ocean areas which are equally important to nature's scheme—and equally important to man's survival on earth.

But, we cannot ignore the short-term needs of our society.

We must, for example, be concerned about today's energy needs in our country, our current international economic problems, and other relatively short-term issues.

In the area of oil and gas development, we must continue to do the best we can to increase domestic production. Even though there are some promising areas to be developed onshore, most agree that our country's significant potential is offshore.

Continental shelf production accounts for about 15 percent of the oil and 23 percent of the gas produced in the United States today. Our plans call for putting several million additional acres under lease every year. Our hopes are that much of this acreage will prove productive. The recent gas finds off the mid-Atlantic coast show how this program can affect our economy. Not only did the stock market react favorably to a quite modest discovery, even to rumors of a discovery, but our beleaguered dollar seemed to get a brief assist in the international arena.

Before oil and gas development activities were proposed in federally controlled areas, a great many other activities were already in place. Commercial enterprise was well established in the form of a sizable fishing industry and significant shipping to and from the major port of Anchorage. A wealth of biological resources inhabited the area, as demonstrated by the multitude of magnificent birds found in the region. At the mouth of the Inlet, for example, densities of birds of more than 1000 per square kilometer have been observed, and approximately 180 species have been identified in the area. Located onshore were small villages preserving an Alaskan native culture and a hardy pioneer culture which small groups of settlers had moved to Alaska to find and keep.

As the result of extensive planning and consultation with all interested parties, the oil and gas leases which I decided to offer last fall allowed us to proceed with oil and gas exploration and development while protecting the social, economic, and ecological stake of people in Alaska and elsewhere. Tracts were selected and stipulations imposed to assure continued use of the area by fishing and shipping industry. Environmental concerns, such as the safety of mammal haul areas and seabird rookeries were also accommodated.

Looking to the future, we face the challenges of the Beaufort Sea, a potential bonanza in oil and gas and an area, again, of rich fragile ecology and isolated, subsistence, native communities. I am working with the Governor of Alaska to bring off this sale in 1979 and believe that accommodations will again allow us to get the energy we need without sacrificing our other interests and values.

In fact, as I indicated a minute or so ago, I believe that this kind of multiple-use compatibility of oil and gas development is achievable throughout most of our outer continental shelf. We have available and will continue to use the best scientific

and technical capability to adjust activities so that diverse users can coexist. A great deal of the work done by those represented at this conference gives us the information and technology base to make this adjustment possible.

Coexistence is not without economic cost. As the Cook Inlet example shows, it involves additional costs on oil and gas operators—occasional use of less efficient air-sea routes for access to leases, costs of special training, costs of special operating methods and environmental studies, and monitoring in biologically sensitive areas.

It also involves costs in the form of more people and time in government research, planning, information sharing, consultation, monitoring, and enforcement activities.

All of these cost the general public. The government costs are direct costs borne by the taxpayer. The costs on the operators are also costs to the public since they reduce the bids which companies are willing to offer for the right to explore and develop the OCS. When public policy make it more costly for oil and gas firms to operate offshore, these firms will bid less for leases.

How much should the public pay for these additional protections? This is one of the most difficult questions I must face. It cannot be reduced to simple equations. You cannot put a price tag on the value of a pristine shoreline or a local lifestyle in Alaska.

How much is it worth to not disturb seabirds at their critical nesting time?

How much should we pay to reduce the risk of ship hitting an OCS platform?

What is an acceptable level of risk?

All these questions deal with values which are highly subjective—different people will see them differently.

It's my job to try to make decisions which reflect the broad balance of public values. And opinions on these issues vary greatly.

I believe that the environmental ethic which began emerging nationally about a decade ago has taken root in America. It was not just a passing fad.

Congressional action on the OCS Lands Act Amendments reflects the public support for OCS development, but with adequate protection for the oceans, the shore, and the affected communities. This legislation provides assurance that improvements we have initiated at the Department of the Interior will be continued in the future. The congressional action adds to my confidence, and should add to public confidence, in our OCS program. It leaves me with the feeling that we have been hitting close to this broad balance of public opinion which I was shooting for in my actions at the Department of Interior.

Oil and gas, of course, are not the only valuable minerals in or under the sea. If the art of international relations were as well developed as the technology of mining, we would already be recovering mineral-rich nodules from the ocean floors.

Our government has negotiated long and hard to achieve a Law of the Sea treaty which will be fair to all nations and which will enable us to begin mining the ocean floor; and are continuing to work toward these goals at the conference table.

Impatience to move forward with ocean mining is quite understandable. At the Department of the Interior, we are excited about the potential of ocean mining, and we are anxious to help clear blockades and provide a system for responsible development of these resources. We hope that the treaty negotiations underway now in New York will result in such a system among nations in the very near future.

Another major issue which has been in the headlines recently concerns protection of endangered species. The Department of the Interior is the primary agency in the onshore program, and we work in cooperation with NOAA to protect threatened or endangered species in the ocean.

It should be emphasized that our efforts have been aimed at helping find ways to build projects or achieve resource development without further threatening or endangering a rare species. Our main tool is consultation and negotiation. The Tellico Dam-snail darter case is an exception which has been in the spotlight while 5500 successful consultants received scant notice.

Whether it be assessing hydrocarbon potential or determining the status of a species, we must have a scientific basis for action.

Within our Department there is a sizable corps of scientists.

The Geological Survey helps map the sea bottom and areas beneath it, evaluates resources, assesses earthquake hazards, and describes sea bottom characteristics.

The Bureau of Land Management supervises and funds studies of the environment both for basic information and assessment of change.

The U.S. Fish and Wildlife Service gathers information on birds and mammals using our oceans and coasts.

It's my job to bring these agencies and their expertise together, and to see that they work as a team. Those of you with intimate knowledge of the Department and its history understand the challenge in this task. But I think that we are making significant progress.

Within the Department there has been some reorganization and adjustments to bring about better teamwork and a better balance in our decision-making processes.

Within the federal government, we could improve our machinery for making policy and carrying out programs which affect the oceans. That is why I have supported the President in his study of the organization of natural resources agencies. A rational policy for our oceans is more surely and readily achievable if important related decisions aren't fragmented among many, necessarily more narrow, decision makers.

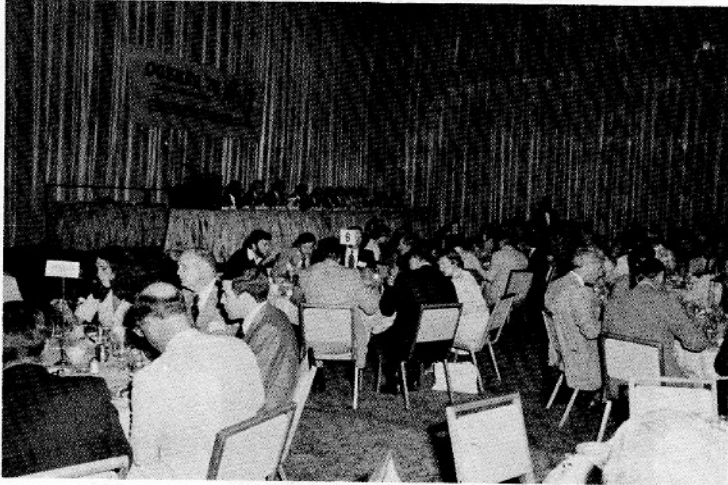
Consolidation can also mean more streamlined and timely action by government—another goal of the President's reorganization plans and a clear desire of the American people. Assembling information, consulting affected interests, reaching acceptable accommodations—these all take time. But time is costly, and we must do our necessary work as quickly as we can. We must resist the temptation of excessive preplanning, which leads to unreasonable exclusions, unachievable commitments, and unrealistic expectations. We cannot put off implementation of policies until each and every resource of a land or water area has been thoroughly assessed. I am committed to moving ahead with necessary government action in every instance where I responsibly can. That is why I did not close down the OCS leasing program while the Congress worked on the new OCS amendments. That is why I have sought to assure the program will move ahead without delay following enactment of that legislation.

I expect our first sale under the new rules—Sale No. 65 in the eastern Gulf of Mexico—will come off next month on schedule.

The corollary of this need to move ahead is that policies, programs, and plans must be flexible enough to be altered when newly discovered facts argue for change. Industry should understand this, and should understand the value of this flexibility in allowing activities to get started, when they press their

demand for "stability in government policy."

Ladies and gentlemen, thank you for this opportunity to express some of my thoughts, and now I look forward to your questions or comments. And as you move into your discussions, do it with the knowledge that the problems are great but with the confidence that we have the expertise to be successful.



View of main table and speakers at OCEANS '78.



Dr. Edward Early receiving the Distinguished Service Award from President Maudlin.



Dr. Richard Moore receiving the Distinguished Technical Achievement Award from President Maudlin.

AWARDS ★★★★★★★★★★★★★★★★★★

Dr. Edward W. Early, immediate past president of the Council on Oceanic Engineering, received the Distinguished Service Award at the OCEANS '78 conference, and Prof. Richard K. Moore, Black and Veatch Distinguished Professor of Electrical Engineering at the University of Kansas, received the Distinguished Technical Achievement Award.

Dr. Early was cited for outstanding and sustained contributions to the Oceanic Engineering community through leadership in the formation of technical councils and conferences. The Distinguished Technical Achievement Award was presented to Prof. Moore for outstanding contributions to engineering and education through his original and sustained leadership in advancing the technology of communications and remoted sensing of the ocean surface from aircraft and satellites.



HAIL AND FAREWELL



Prof. Donald M. Bolle, who will leave his position as editor of *Journal of Oceanic Engineering*.

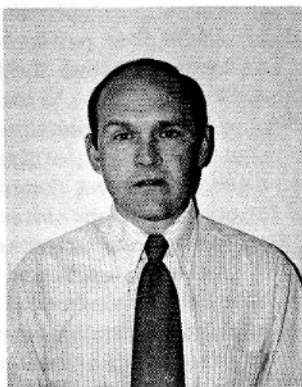
Prof. Donald Bolle, who was a founding member of the Council on Oceanic Engineering and has been the only editor of the *Journal of Oceanic Engineering*, has resigned the editorship, effective Jan. 1979, in order to take a sabbatical leave during the academic year, 1979-1980. Prof. Bolle will spend his leave at the Imperial College, London, England.

Assuming the editor's duties will be Prof. David E. Weissman, who currently serves as Secretary of the Council. Accepting a position as an associate editor is Dr. Gary S. Brown.

Our appreciation to Don for his dedicated service to the Council cannot be overstated—nor can our thanks to Dave and Gary for undertaking their new jobs.



GARY S. BROWN



Gary S. Brown was born in Jackson, MI, on April 13, 1940. He received the B.S., M.S., and Ph.D. degrees in electrical engineering, all from the University of Illinois, Urbana.

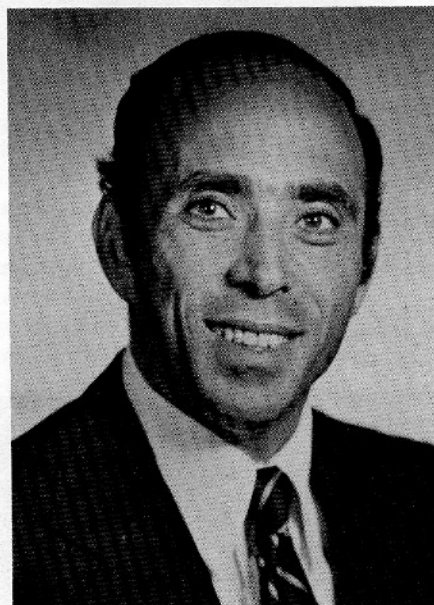
From 1963 to 1967 he was a Research Assistant in the Antenna Laboratory of the University of Illinois, where he was involved with direction-finding antenna systems, low-loss millimeter waveguides, and shaped-beam millimeter antenna designs. While in the U.S. Army Signal Corps (1968-1969), he served in an engineering capacity dealing with the Integrated Wideband Communications System in the Republic of Vietnam. During 1970 he was employed by TRW Systems Group

in Redondo Beach, CA, where his work involved monopulse, ECM, and multiple-beam antenna analysis and development. From 1971 to 1973 he was with the Research Triangle Institute, Durham, NC, where his primary area of interest was radar altimetry. He is currently with Applied Science Associates, Inc., Apex, NC, where his present work involves microwave remote sensing, rough surface scattering, and transient electromagnetic scattering.

He served on the Technical Committee of the 1972 IEEE/G-AP Symposium and assisted the Special Events Chairman during the 1978 IEEE/AP-S Symposium. He is a member of Eta Kappa Nu, Sigma Xi, and Commissions B and F of URSI, and received the 1978 R. W. P. King Award from the IEEE Antennas and Propagation Society (AP-S).



DAVID E. WEISSMAN



David E. Weissman was born in New York, NY on September 18, 1937. He received the B.E.E. and M.E.E. degrees from New York University in 1960 and 1961, respectively, and the Ph.D. degree in electrical engineering from Stanford University, Stanford, CA, in 1968.

From 1961 to 1963, he was with Dorne and Margolin Inc., Westbury, NY engaged in antenna and microwave component design. He joined the Stanford Research Institute, Menlo Park, CA, as a research engineer in 1963. His research activities there involved the study of linear and nonlinear electromagnetic interactions with plasmas, the measurement of plasma properties, and radar studies of turbulent plasmas. Since 1968 he has been on the faculty of the Department of Engineering and Computer Sciences of Hofstra University, Hempstead, NY and is currently an Associate Professor. During the 1975-1976 academic year he was on sabbatical leave and held a NASA-NRC Senior Resident Research Associateship at the Jet Propulsion Laboratory of the California Institute of Technology, Pasadena, CA. For the past several years he has been actively involved in the study of electromagnetic scattering by rough surfaces with application to

radar and radiometric measurement of ocean surface properties from aircraft and spacecraft, in association with the Electromagnetics Research Branch of the NASA Langley Research Center and the Jet Propulsion Laboratory. He was awarded (with coauthor) an award for the Best Applications Paper for 1977 in the IEEE Transactions on Antennas and Propagation.

Dr. Weissman is a senior member of the IEEE and is a representative of the Antennas and Propagation Society to the IEEE Council on Oceanic Engineering. He is presently Secretary to this Council and an Associate Editor of the *IEEE Journal of Oceanic Engineering*. He is also a member of AAAS, the American Association of University Professors, and Commission F of the International Union of Radio Science.



WORKSHOP ANNOUNCEMENT

IMPROVING THE SURVIVABILITY OF UNDERWATER CABLES AND CONNECTORS

A two-day Workshop sponsored by the Cable and Connector Committee of the Marine Technology Society will be held in San Diego, CA, 7 and 8 February, 1979.

The primary intent of the Workshop is the informal exchange of technical information, discussion of unsolved problems and unmet needs, and technology transfer related to the theme, "Improving the Survivability of Underwater Cables and Connectors." Audience participation will be encouraged and emphasized.

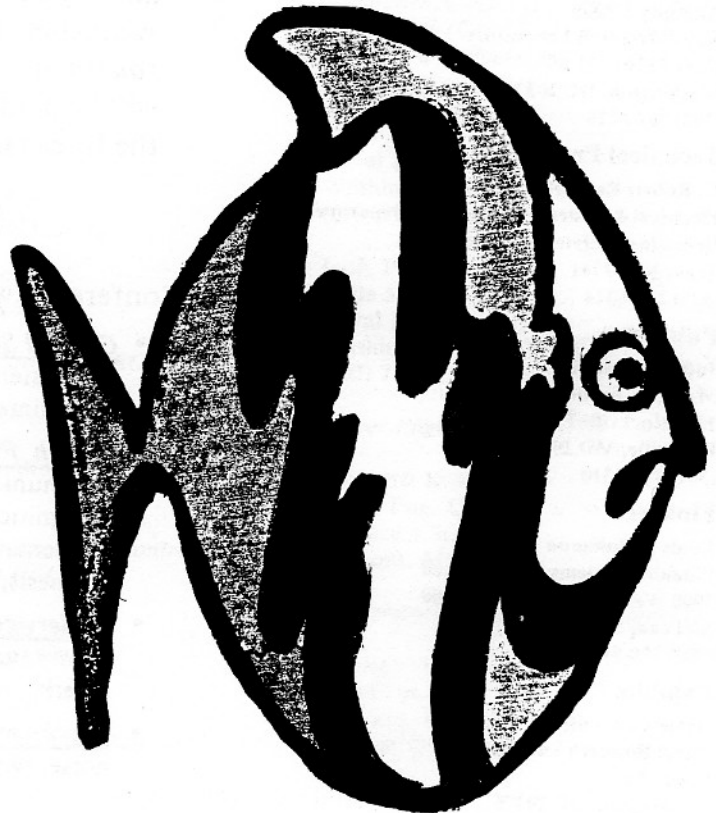
Cable and connector users will make 15-20 minute presentations of their experiences (successes and failures) related to specification, procurement, installation, and use of underwater cables and connectors. Cable and connector design engineers will discuss customer inputs required and design and fabrication compromises; and address user problems.

To encourage free-wheeling discussions among speakers and attendees, no proceedings will be published and no recordings permitted. Adequate time and space will be provided for small groups to gather for discussion of specific problems, exchange of ideas, and general updating of information on new technology.

Question-and-answer periods will follow each speaker's presentation. Also, written questions or comments submitted before or during the Workshop will be accepted. Speakers will be available for small-group discussions during programmed free-time periods.

This is an opportunity to meet with many other underwater cable and connector users and manufacturers for sharing ideas, solving problems, and updating awareness in the state-of-the-art in underwater cables and connectors.

For further information contact William F. Stange, Marine Systems Division, Preformed Line Products Company, P. O. Box 91129, Cleveland, OH 44101; telephone: (216) 461-5200.



1979 IEEE International Conference on
**ACOUSTICS, SPEECH AND
SIGNAL PROCESSING**



THE INSTITUTE OF
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ELECTRONICS
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WASHINGTON, DC

2 TO 4 APRIL 1979

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Rensselaer Polytechnic Institute
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(518) 270-6324

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Jude E. Franklin
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Finance

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(703) 790-5950

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Proceedings

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MEETING ANNOUNCEMENT

1979 ICASSP

The 1979 International Conference on Acoustics, Speech and Signal Processing (ICASSP), sponsored by the IEEE Acoustics, Speech and Signal Processing Society, is the *fourth* in a series of growing annual conferences. It will be held on April 2, 3, and 4 in Washington, DC, at the International Inn.

AREAS OF INTEREST

The Conference will be devoted to the areas of:

- General Signal Processing - (Spectral analysis, filter design, software and systems, hardware and architecture, structures and quantization, multidimensional processing, high speed algorithms, etc.).
- Speech Processing - (Analysis, wideband and narrowband speech communication and evaluation, aids for the handicapped, automatic recognition/understanding of continuous speech, automatic speech segmentation and phoneme recognition, speech production and synthesis, etc.).
- Underwater Acoustics, Seismic Signals and Radar - (Hardware, theory and experimentation, detection and localization, adaptive filtering and beamforming, simulation, etc.).
- Psychoacoustics, Electroacoustics - (Loud speakers, environmental noise, physiological noise, recording and reproduction.).

SPECIAL FEATURES

- The Annual Award Banquet will feature America's only Underwater Band accompanied by a brief technical explanation.
- ITX - This year will initiate Informal Technical Exchange Session on April 2nd. The purpose is for the standing committees to sponsor a free exchange of technical concepts as well as a forum to announce late breaking developments. For further information, contact

Dr. G. Robert Redinbo
Electrical & Systems Engineering Department
Rensselaer Polytechnic Institute
Troy, NY 12181
(518) 270-6324

THERE WILL BE AN EXHIBITION AREA

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Mass. Inst. Technol.
Cambridge, MA 02139

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Crane, IN 47522
(812) 854-1363
(Vacancy for 2nd representative)

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Code 91
Naval Ocean Systems Ctr.
San Diego, CA 92152
(714) 225-2332

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Univ. Washington
Seattle, WA 98195
(206) 543-1300

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U.S. Coast Guard
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Washington, DC 20590
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College Station, TX 77843
(713) 845-4211

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CMDR. R. H. CASSIS, JR.
Commandant (G-DOE-3/TPS1)
U.S. Coast Guard
Washington, DC 20590
(202) 426-1027

ARTHUR S. WESTNEAT
146 Paradise Ave.
Middletown, RI 02840
(401) 864-3875

JOSEPH S. VADUS
NOOA Office of Ocean Eng.
610 Executive Blvd.
Rockville, MD 20852
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John Hopkins Univ.
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(301) 953-7100, Ext. 3666

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FCC Rm. 7310-C
1919 M St., N.W.
Washington, DC 20554
(202) 632-6350

Vice President, West Coast

RICH C. ROBINSON
3559 Kenyon St.
San Diego, CA 91754
(714) 224-4101

IEEE JOURNAL OF OCEANIC ENGINEERING

Editor

DONALD M. BOLLE
Division of Engineering
Brown University
Providence, RI 02912
(401) 863-2602

Newsletter Editor

HAROLD A. SABBAGH
Naval Weapons Support Ctr.
Code 7055
Crane, IN 47522
(812) 854-1363

Associate Editors

THOMAS M. DAUPHINEE
Div. Phys.
Nat. Res. Council
Ottawa, Ont. K1A0R6
Canada

DAVID E. WEISSMAN
Dept. Eng. & Comput. Sci.
Hofstra Univ.
Hempstead, NY 11550

STANLEY L. EHRlich
Raytheon Co.
Submarine Div.
P.O. Box 360
Portsmouth, RI 02871

ARTHUR B. BAGGEROER
Dept. Ocean Eng.
Mass. Inst. Technol.
Cambridge, MA 02139

RONALD L. SPOONER
Planning Syst., Inc.
7900 Westpart Dr.
Suite 507
McLean, VA 22101

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