PRESIDENT’S COMMENTS

The new era has begun, we are now the Oceanic Engineering Society (SOE), a full fledged IEEE Society. As in the beginning of any new era, there are great challenges before us and the future holds bright promises. We now have the opportunity to do things as a Society that we could not do previously under the old Council structure. The principal opportunity, and the prime mover in our becoming a Society, is the ability to have members and to organize local chapters, thereby developing a grass roots community with interests in oceanic engineering. Active chapters will provide us with local organizations which can help run the OCEANS Conferences and allow the locations of these to continue to move around the country, and beyond. They will allow us to meet with our professional colleagues on a more regular and informal basis and receive the awareness, stimulation and personal growth that flows from that.

And with the opportunities come responsibilities. Many are clearly implied in the above challenge to organize local chapters. Beyond that, we must clearly establish ourselves as a Society, with distinctives which are clear and clearly communicated. We must work through the new relationships with the other IEEE Societies, especially those who previously sponsored us as a Council. While we are in one sense launching out as a new Society, we must remember that oceanic engineering is multi-disciplinary. Changing our organizational structure does not change that; we still need the other Societies and they continue to need us. The ocean is an environment in which the disciplines represented in the various IEEE Societies will continue to be applied. As a Council we had a natural linkage to the Societies which sponsored us. While they no longer sponsor us, we must maintain that linkage, for our benefit and theirs. Perhaps we need technical committees which parallel the Societies; perhaps these committees should be joint-society committees.

These and many other issues and challenges need to be worked out as we establish ourselves as a Society. This is a time in which we need everybody’s involvement. I hope you see the challenge and the opportunity for you to participate with us. If you are not currently involved in SOE activities and would like to be, please contact me or one of the other officers of the Society.

Stanley G. Chamberlain
President
OCEANIC ENGINEERING SOCIETY

CURRENT MEASUREMENT TECHNOLOGY COMMITTEE
William E. Woodward
NOAA A.WSC-5
6010 Executive Blvd.
Rockville, MD 20852
(301) 443-8443

EDITOR, IEEE JOURNAL OF OCEANIC ENGINEERING
Stanley Ehrlich
Raytheon Company
Submarine Signal Division
Box 360
Portsmouth, RI 02871
(401) 849-7860

NEWSLETTER EDITOR
Harold A. Sabbagh
Analytic, Inc.
2634 Round Hill Lane
Bloomington, IN 47401
(812) 339-3466

ASSOCIATE EDITORS
Arthur B. Baggeroer
Dept. of Ocean Engnr.
Room 5-326
MA Institute of Tech., Cambridge, MA 02139
(617) 253-4336

John Ehrenberg
Applied Physics Laboratory
University of Washington
Seattle, WA 98195
(206) 543-1300

Gary S. Brown
Applied Science Associates
105 East Chatham
Apt. 7C
(919) 362-9311

Adrian K. Fung
Remote Sensing Lab
Univ. of Kansas
2291 Irving Hills Dr., Campus West Lawrence, KS 66045
(913) 864-4832

Thomas M. Dauphinie
Division of Physics
National Research Council
Montreal Road
Ottawa, Ontario
Canada K1A 0R6
(613) 993-2313

Robert C. Spinell
Dept. of Ocean Engineering
Woods Hole Oceanographic Institute
Woods Hole, MA 02543
(508) 424-2883

Calvin T. Swift
Dept. of Electrical & Computer Engineering
University of Massachusetts
Amherst, MA 01003
(413) 545-2176 (office)
(413) 545-2442 (messages)

Anthony J. Elder
Code 5109
Naval Research Lab.
Washington, DC 20375
(202) 767-3594

AEROSPACE AND ELECTRONIC SYSTEMS (AES-10)
Mr. Richard C. Robinson
800 Fulton Lane
Suite 245
Vienna, VA 22180
(703) 281-7920

Arthur S. Westen, Jr.
Wadleigh Falls Road
R. D. #1
Newmarket, NH 03857
(603) 629-2180

Altamirre
Malcolm X Bankhead
President
Systems & Applied Sciences Corp.
6811 Kemnworth Avenue
Riverdale, MD 20840

ANTENNAS AND PROPAGATION (AP-03)
Harb S. Hayre
Electrical Engineering Dept.
Wave Prop. Lab.
University of Houston
Houston, TX 77004
(713) 740-4674

David E. Weissman
Hofstra University
5 Orchard Drive
Northport, NY 11768
(516) 299-2500

CIRCUITS AND SYSTEMS (CAS-04)
Rui D. Figueiredo
Dept. of Electrical Engineering
University of Houston
Houston, TX 77001
(713) 740-5801 X-3506

Sydney R. Parker
Naval Postgraduate School
Monterey, CA 93940
(408) 646-2788

COMMUNICATIONS (COM-49)
Walter L. Bacon
323 N. Elizabeth Ave.
Pomona Park, CA 91764
(213) 573-5663

Satoru Tashiro
14489 N.E. 12th Place
Bellevue, WA 98006
(206) 476-9294

COMPONENTS, HYBRIDS, AND MANUFACTURING TECHNOLOGY (CHMT-21)
Dr. Arturo Christou
Naval Research Laboratory
Code 6815
Washington, DC 20375
(202) 767-2799

COMPUTER (COMP-46)
David H. Stumberg
Computer Sciences Corp.
4045 Hancock St.
San Diego, CA 92110
(714) 223-8401 X-528

Glen N. Williams
(OTC Technical Program., Rep.)

CONTROL SYSTEMS (CS-23)
John J. Anton
Systems Control, Inc.
1801 Park Mill Road
Palo Alto, CA 94304
(415) 494-165X X-205

Dr. Chamberlain's research interests have been in the application of mathematical modeling and systems analysis techniques to oceanic environment and sonar systems problems. His work has included development of numerical methods to predict acoustic propagation in the ocean and application of signal processing approaches to problems in sonar. He has applied analytic modeling and simulation techniques to aquatic environment processes, including river, estuary and coastal hydrodynamic circulation and water quality dispersion. His interests include optimization theory and the statistical theories of signal detection, communication, estimation and control.

Since joining Raytheon’s Submarine Signal Division in 1963, he has held a variety of positions in the Applied Research Department, Marine Research Laboratory, Oceanographic and Environmental Services Department, and Systems Engineering Laboratory. Currently, he is a Principal Engineer in the Systems Engineering Laboratory, where he is responsible for performing and/or supervising sonar systems analysis and computer simulations for advanced sonar systems.

Dr. Chamberlain has published and presented over forty technical papers and reports. Publishing journals and professional society conferences include those of the IEEE, Acoustical Society of America (ASA), Society for Industrial and Applied Mathematics, Mathematical Analysis and Applications, Institute for Environmental Sciences, Great Lakes Research Association and the American Water Resources Association. He is a member of IEEE, ASA and Sigma Pi Sigma. He recently served as General Chairman of the IEEE/MTS OCEANS '81 Conference and is currently President of the IEEE Oceanic Engineering Society.

Superconducting Electromagnets For Vessel Propulsion

Researchers at the Kobe University of Mercantile Marine, Japan, have completed scale model studies on a ship propulsion system which does not need propellers to convert mechanical motion into thrust. The new propulsion system utilizes the reaction between a super-cooled electromagnet and electrically-charged seawater to produce thrust.

The “engine” would consist of a pipe, which runs length-wise down the ship’s hull, that is surrounded or straddled by a superconducting electromagnet which uses liquefied helium at minus 269 degrees Celsius to create a very intense magnetic field. By passing an electric current through the water in the pipe, the researchers say that the seawater is forced back through the pipe, causing the vessel to move forward.

Satisfied that the theory works in real-life and encouraged by scale model results, the scientists plan to build a 10-meter long prototype ship equipped with a 1.4 meter diameter, 3.2 meter long “thrust pipe” for conducting tests at sea. Blue prints have even been drawn up for a 10,000-ton commercial submarine tanker which would employ the Superconducting Electromagnetic Thrust (SET) system.

There are still several problems to be solved, however. The largest obstacle the researchers see is the by-product of hydrogen and chlorine gases which are created when electricity is passed through seawater. The hydrogen is no problem, the scientists say, but chlorine gas could create serious pollution problems.
MESSAGE FROM THE CHAIRMAN

It is with great pleasure that I extend a cordial invitation to you to attend the OCEANS '83 Conference and Exhibition. This year's title, the theme of OCEANS '83, "Effective Use of the Sea — An Update," describes the objective of the Conference, which is to update the three historic reports of a decade ago: The President's Scientific Advisory Committee's report, "The Effective Use of the Sea;" the Stratton Commission's report, "Our Nation and the Sea, A Plan for National Action;" and the NAE Marine Board report, "Towards Fulfillment of a National Commitment."

Much has happened since these reports were written, and the objective of the OCEANS '83 technical program will be to evaluate our technical progress against the goals and objectives laid down in these three historic reports.

You will note from the details of the Advanced Program that plenary sessions will be held which update and critically assess the status of ocean science and technology. The technical sessions are organized so as to focus on the five major resource areas identified in the above reports. Emphasis will be placed on important technologies, technology assessment, applications and programs in each of these areas.

The program will be of equal interest to the scientists, engineers, and managers from Academia, Industry and Government. We are particularly proud of the number of participating societies and organizations which are joining with the IEEE Oceanic Engineering Society and the Marine Technology Society in organizing this Conference.

In addition to the technical sessions, there will be an extensive exhibit area where the latest in marine products, services and systems will be displayed.

Social activities are planned for both the participants and their families. San Francisco, its harbor, bridges, museums and parks make it an ideal summer-end vacation spot. I hope to welcome you there on August 29th.

James G. Wenzel
Vice President
Lockheed Marine Systems Group
General Chairman-OCEANS '83

OCEANS 83 ADVISORY BOARD

Dr. Donald H. Bolle
Lehigh University
President IEEE

Dr. John Byrne
Administrator
National Oceanic & Atmospheric Administration

Mr. Herbert Gabrail
General Manager
Westinghouse

RADM John J. Ekelund, USN
Superintendent
U.S. Navy Post Graduate School

Mr. Robert A. Fuhrman
President
Lockheed Missiles & Space Co., Inc.

Mr. Arthur Haskell
Senior Vice President
Matson Lines

Mr. Theodore Heidingson
Senior Technical Staff Manager
Boeing Aerospace

Dr. Martha Kohler
Manager Environmental Services Dept.
Bechtel Corp.

VADM Charles E. Larkin
United States Coast Guard
Past President IEEE

Dr. Robert Larsen
Systems Control Inc.

Mr. Gilbert L. Maton
Tracor Jilco

President MTS

Dr. William Miller
President
SRI International

Dr. William A. Nierenberg
Director
Scripps Institute of Oceanography

Conference organized by:
The Marine Technology Society and
The Institute of Electrical and Electronics Engineers/Oceanic Engineering Society

Participating Societies & Organizations:
American Society of Civil Engineers
American Geophysical Union
American Society of Naval Engineers
Center for Oceans Law and Policy, Univ. of Virginia
National Energy Resources Organization
Acoustical Society of America
New England Estuarine Research Society
American Institute of Aeronautics and Astronautics
The Society of Naval Architects and Marine Engineers
National Ocean Industries Association
Shipbuilder's Council of America
American Oceanic Organization
The Society of American Military Engineers
American Association for the Advancement of Science
American Petroleum Institute
Geological Society of America
National Association of Corrosion Engineers
European Association of Remote Sensing Laboratories
Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt e.V.

Center for the Study of Marine Policy, Univ. of Delaware

Marine Board---Nat'l Research Council

U.S./Japan Cooperative Program in Natural Resources

National Advisory Committee on Oceans and Atmosphere

Engineering Committee for Ocean Resources

Mr. William T. Silcox
Standard Oil Co. of California

Dr. Athelstan Spilhaus

Dr. Frank Talbot
Director
California Academy of Sciences

Mr. Joseph Vadus
NOAA/OTEC Program
Management Office
MONDAY

PROGRAM SCHEDULE
EXPLANATION
The OCEANS '83 Technical Program has been organized around the following major categories of ocean activity:
  • Mineral Resources and Energy
  • Non-Mineral Resources
  • Civil/Military Ocean Engineering
  • Transportation
  • Ocean Science

The program begins with a plenary session on Monday morning with two major addresses which will review the status of our knowledge of the ocean and oceanic issues. On Monday afternoon, in five concurrent sessions, each of the major categories will be introduced with an overview paper followed by a series of papers covering emerging and important technologies and issues in the field.

The Tuesday program will consist of ten concurrent sessions covering major technical subjects within each of the categories.

On Wednesday, the technical program will offer five concurrent sessions in the morning, and a closing plenary in the afternoon. The morning sessions, organized around the five categories, will deal with major ocean programs and projects. In the afternoon, a closing plenary session, a report by members of the Blue Ribbon Panel, updating the PSAC, Stratton Commission, and NAE/COE reports, will be presented. In a concluding portion of this plenary, representatives of Congress will comment on the panel's report and discuss possible implications for Congressional action.

The schedule to the right highlights the session organization and content. An effort has been made to minimize conflict between sessions of similar technical interest. The last page details the field trip and spousal activities.

POSTER SESSIONS
As a result of the unique requirements of many of the presentations, poster sessions will be an important part of OCEANS '83. The poster sessions topics will be organized around the five major categories of the conference, and presented out-of-phase with the program segments in order to eliminate conflicts.

OPENING PLENARY
Chair: J. G. Wenzel, Chairman OCEANS '83
Keynote Speakers
Dr. Ferris Webster,
College of Marine Studies,
University of Delaware
Dr. John Knaus,
University of Rhode Island

Mr. James G. Wenzel, Vice President of Lockheed Ocean Systems and General Chairman for OCEANS '83, will open the conference with a welcome to the attendees, followed by an introduction of the Blue Ribbon Panel. This panel, organized by the Marine Board of the National Research Council, will attend the technical sessions, and will review the conference and update the PSAC, Stratton Commission and NAE/COE reports at the closing plenary session on Wednesday. Dr. Knaus will review the status of marine affairs since the historic reports were issued. Dr. Webster will review the advancements in ocean science over the past 10-15 years and the outlook for the future.

OCEANS '83 & IGARS '83

JOINT REGISTRATION
The 1983 International Geoscience and Remote Sensing Symposium (IGARS '83) will be held August 31—September 2, 1983, also at the San Francisco Hilton Hotel. The symposium is sponsored by the IEEE Geoscience and Remote Sensing Society and the U.S. National Committee of the International Scientific Radio Union (URSI).

Technical sessions will be coordinated to provide comprehensive program stressing the problems and perspectives of the geoscience disciplines, instrumentation systems, data processing techniques and sensor-target models. For further information contact Mr. Mike Buttriner, M.S. L-156, Lawrence Livermore National Laboratory, P.O. Box 5504, Livermore, CA 94550, tel: (415) 422-6686.

The OCEANS '83 & IGARS '83 have arranged for joint registration, with reduced fees, for persons wishing to attend both conferences. You may register for both conferences by completing the appropriate section of the registration form and enclosing the additional registration fee.

MINERAL RESOURCES & ENERGY
Dr. Claude R. Hocott,
Gulf Universities Consortium
Dr. J. Robert Moore,
Marine Science Institute,
University of Texas, Austin

Dr. Moore and Hocott will jointly introduce this category. Dr. Moore will review the status of marine mineral resource development, and Dr. Hocott will provide an overview of ocean energy.

NON-MINERAL RESOURCES
Dr. William S. Gaither,
College of Marine Studies,
Univ. of Delaware

Dr. Gaither will introduce this category with a paper that reviews the development and present status of knowledge regarding marine non-mineral resources.

CIVIL/MILITARY OCEAN ENGINEERING
Rear Admiral John B. Mooney
Oceanographer of the Navy

ADM Mooney introduces this category with a paper which reviews the status of ocean engineering and the interdependence between the civil and military technologies.

TRANSPORTATION
Mr. John Wing,
Booz-Allen-Hamilton, Inc.
Dr. Don Walsh, Institute of Marine & Coastal Studies,
University of Southern Calif.

Mr. Wing, assisted by Dr. Walsh, will chair this category. Mr. Wing will present a paper addressing the status, issues, and technical challenges in the field of marine transportation. The session continues with selected papers dealing with emerging and important technologies in the area of transportation. It is expected that these will include papers on vehicle systems, ice-areas operations, and others.

OCEAN SCIENCE
Mr. Feenan D. Jennings,
Texas A & M University

Mr. Jennings will introduce this portion of the program with a paper that outlines the future of ocean science and the major thrusts and critical research needs of the main ocean science disciplines.

CHAIRMAN'S LUNCHEON:
Speaker: James Curnin

IEEE/OGS DINNER MEETING
MTS COMMITTEE MEETINGS

EXHIBITS
OCEANS '83 will also feature exhibits from a wide variety of companies and organizations involved in marine affairs.

The exhibit hall will be open Monday, from 9:00 a.m. to 7:00 p.m., Tuesday from 9:00 a.m. to 5:00 p.m., Wednesday from 9:00 a.m. to 5:00 p.m. At press time the following exhibitors are confirmed:
<table>
<thead>
<tr>
<th>PLATE TECTONICS &amp; GEOLOGY</th>
<th>PLATE TECTONICS &amp; GEOLOGY</th>
<th>PLATE TECTONICS &amp; GEOLOGY</th>
<th>PLATE TECTONICS &amp; GEOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. Cailhes, Chevron Oil Research Co; N.L. Sleep, Geophysical Depart., Stanford University</td>
<td>rift propagation &amp; plate tectonics</td>
<td>rift propagation &amp; plate tectonics</td>
<td>rift propagation &amp; plate tectonics</td>
</tr>
<tr>
<td></td>
<td>hydrothermal circulation &amp; magma chambers of mid-ocean ridges</td>
<td>hydrothermal circulation &amp; magma chambers of mid-ocean ridges</td>
<td>hydrothermal circulation &amp; magma chambers of mid-ocean ridges</td>
</tr>
<tr>
<td></td>
<td>volcanic eruption patterns along rift zones</td>
<td>volcanic eruption patterns along rift zones</td>
<td>volcanic eruption patterns along rift zones</td>
</tr>
<tr>
<td></td>
<td>hydrothermal mineral deposit estimates</td>
<td>hydrothermal mineral deposit estimates</td>
<td>hydrothermal mineral deposit estimates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECREATION</th>
<th>RECREATION</th>
<th>RECREATION</th>
<th>RECREATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
</tr>
<tr>
<td>RECREATION</td>
<td>RECREATION</td>
<td>RECREATION</td>
<td>RECREATION</td>
</tr>
<tr>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
<td>T. Morath, Dept. of Rec. &amp; Leisure Studies, Cal. State, Northridge; R.C. Kelly, Dept. of Fish &amp; Game</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OFFSHORE ENGINEERING 1</th>
<th>OFFSHORE ENGINEERING 1</th>
<th>OFFSHORE ENGINEERING 1</th>
<th>OFFSHORE ENGINEERING 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. Purser, Seale Consortium, Ltd</td>
<td>safety analyses of dry subsea production systems</td>
<td>safety analyses of dry subsea production systems</td>
<td>safety analyses of dry subsea production systems</td>
</tr>
<tr>
<td></td>
<td>measures of breakout resistance of sealflap embedded objects</td>
<td>measures of breakout resistance of sealflap embedded objects</td>
<td>measures of breakout resistance of sealflap embedded objects</td>
</tr>
<tr>
<td></td>
<td>motion compensation &amp; handling systems</td>
<td>motion compensation &amp; handling systems</td>
<td>motion compensation &amp; handling systems</td>
</tr>
<tr>
<td></td>
<td>world-wide wave climate synthesis</td>
<td>world-wide wave climate synthesis</td>
<td>world-wide wave climate synthesis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MARINE BIOLOGY</th>
<th>MARINE BIOLOGY</th>
<th>MARINE BIOLOGY</th>
<th>MARINE BIOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. Queen, Inst. of Coastal &amp; Mar. Studies, East Carolina Univ; G. Robillard, Woodward-Clyde Consists.</td>
<td>benthic monitoring</td>
<td>benthic monitoring</td>
<td>benthic monitoring</td>
</tr>
<tr>
<td></td>
<td>hard &amp; live bottom definitions</td>
<td>hard &amp; live bottom definitions</td>
<td>hard &amp; live bottom definitions</td>
</tr>
<tr>
<td></td>
<td>marine resource detection techniques</td>
<td>marine resource detection techniques</td>
<td>marine resource detection techniques</td>
</tr>
<tr>
<td></td>
<td>biological impacts of heavy metal &amp; organic chemical waste disposal</td>
<td>biological impacts of heavy metal &amp; organic chemical waste disposal</td>
<td>biological impacts of heavy metal &amp; organic chemical waste disposal</td>
</tr>
<tr>
<td></td>
<td>on marine invertebrates &amp; corals</td>
<td>on marine invertebrates &amp; corals</td>
<td>on marine invertebrates &amp; corals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OFFSHORE STRUCTURES</th>
<th>OFFSHORE STRUCTURES</th>
<th>OFFSHORE STRUCTURES</th>
<th>OFFSHORE STRUCTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Cordy, Naval Civil Engineering Lab; M. C. Cheung, MCA Engineers, Inc.</td>
<td>underwater inspection of structures</td>
<td>underwater inspection of structures</td>
<td>underwater inspection of structures</td>
</tr>
<tr>
<td></td>
<td>scale &amp; numerical modeling</td>
<td>scale &amp; numerical modeling</td>
<td>scale &amp; numerical modeling</td>
</tr>
<tr>
<td></td>
<td>ocean testing of concrete pressure resistant structures</td>
<td>ocean testing of concrete pressure resistant structures</td>
<td>ocean testing of concrete pressure resistant structures</td>
</tr>
<tr>
<td></td>
<td>interaction analyses for deep water structures</td>
<td>interaction analyses for deep water structures</td>
<td>interaction analyses for deep water structures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MANNED UNDERSEA VEHICLES &amp; HABITATS</th>
<th>MANNED UNDERSEA VEHICLES &amp; HABITATS</th>
<th>MANNED UNDERSEA VEHICLES &amp; HABITATS</th>
<th>MANNED UNDERSEA VEHICLES &amp; HABITATS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>machinery &amp; materials</td>
<td>machinery &amp; materials</td>
<td>machinery &amp; materials</td>
</tr>
<tr>
<td></td>
<td>hybrid manned/unmanned systems</td>
<td>hybrid manned/unmanned systems</td>
<td>hybrid manned/unmanned systems</td>
</tr>
<tr>
<td></td>
<td>batteries &amp; power generating equipment</td>
<td>batteries &amp; power generating equipment</td>
<td>batteries &amp; power generating equipment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MARINE MATERIALS &amp; CONNECTORS</th>
<th>MARINE MATERIALS &amp; CONNECTORS</th>
<th>MARINE MATERIALS &amp; CONNECTORS</th>
<th>MARINE MATERIALS &amp; CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. Berian, State University of N.Y.; H. Herman, Rochester Corp.</td>
<td>lightweight composite pre-stressed concrete</td>
<td>lightweight composite pre-stressed concrete</td>
<td>lightweight composite pre-stressed concrete</td>
</tr>
<tr>
<td></td>
<td>titanium alloys</td>
<td>titanium alloys</td>
<td>titanium alloys</td>
</tr>
<tr>
<td></td>
<td>wood preservations</td>
<td>wood preservations</td>
<td>wood preservations</td>
</tr>
<tr>
<td></td>
<td>wet mateable connectors</td>
<td>wet mateable connectors</td>
<td>wet mateable connectors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REMOTELY OPERATED VEHICLES</th>
<th>REMOTELY OPERATED VEHICLES</th>
<th>REMOTELY OPERATED VEHICLES</th>
<th>REMOTELY OPERATED VEHICLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Wernil, Naval Ocean Sys. Cen.; D. Greenberg, Lockheed Missle &amp; Space Corp.</td>
<td>advanced search systems</td>
<td>advanced search systems</td>
<td>advanced search systems</td>
</tr>
<tr>
<td></td>
<td>ship hull inspection vehicles</td>
<td>ship hull inspection vehicles</td>
<td>ship hull inspection vehicles</td>
</tr>
<tr>
<td></td>
<td>acoustic navigation systems</td>
<td>acoustic navigation systems</td>
<td>acoustic navigation systems</td>
</tr>
<tr>
<td></td>
<td>simplified pilothouse displays &amp; control systems</td>
<td>simplified pilothouse displays &amp; control systems</td>
<td>simplified pilothouse displays &amp; control systems</td>
</tr>
<tr>
<td></td>
<td>deep diving vehicles</td>
<td>deep diving vehicles</td>
<td>deep diving vehicles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEATHER QUALITY</th>
<th>WEATHER QUALITY</th>
<th>WEATHER QUALITY</th>
<th>WEATHER QUALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Edge, Comb. Engineering, Ltd.</td>
<td>estuary circulations</td>
<td>estuary circulations</td>
<td>estuary circulations</td>
</tr>
<tr>
<td></td>
<td>pollution &amp; discharge monitoring</td>
<td>pollution &amp; discharge monitoring</td>
<td>pollution &amp; discharge monitoring</td>
</tr>
<tr>
<td></td>
<td>protection of estuaries against oil spills</td>
<td>protection of estuaries against oil spills</td>
<td>protection of estuaries against oil spills</td>
</tr>
<tr>
<td></td>
<td>solids distributions near marine discharges</td>
<td>solids distributions near marine discharges</td>
<td>solids distributions near marine discharges</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WATERSHIP</th>
<th>WATERSHIP</th>
<th>WATERSHIP</th>
<th>WATERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. Conte, Aquaculture Extension, Univ. of Cal. Davis; D. Conklin, Bodega Bay Marine Lab</td>
<td>biochemical &amp; genetic engineering</td>
<td>biochemical &amp; genetic engineering</td>
<td>biochemical &amp; genetic engineering</td>
</tr>
<tr>
<td></td>
<td>salmon ranching</td>
<td>salmon ranching</td>
<td>salmon ranching</td>
</tr>
<tr>
<td></td>
<td>crustacean aquaculture</td>
<td>crustacean aquaculture</td>
<td>crustacean aquaculture</td>
</tr>
<tr>
<td></td>
<td>marine plant culturing &amp; harvesting</td>
<td>marine plant culturing &amp; harvesting</td>
<td>marine plant culturing &amp; harvesting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PORT OPERATIONS</th>
<th>PORT OPERATIONS</th>
<th>PORT OPERATIONS</th>
<th>PORT OPERATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Stone, Port of San Francisco</td>
<td>port requirements</td>
<td>port requirements</td>
<td>port requirements</td>
</tr>
<tr>
<td></td>
<td>inspection, dredging, logistics</td>
<td>inspection, dredging, logistics</td>
<td>inspection, dredging, logistics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OCEAN INSTRUMENTATION</th>
<th>OCEAN INSTRUMENTATION</th>
<th>OCEAN INSTRUMENTATION</th>
<th>OCEAN INSTRUMENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Jaeger, Hydro Products; T. Dauphine, Div. of Physics, Nat. Research Council, Canada</td>
<td>waves &amp; currents</td>
<td>waves &amp; currents</td>
<td>waves &amp; currents</td>
</tr>
<tr>
<td></td>
<td>air/sea interface definitions</td>
<td>air/sea interface definitions</td>
<td>air/sea interface definitions</td>
</tr>
<tr>
<td></td>
<td>fisheries assessment</td>
<td>fisheries assessment</td>
<td>fisheries assessment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHYSICAL OCEANOGRAPHY</th>
<th>PHYSICAL OCEANOGRAPHY</th>
<th>PHYSICAL OCEANOGRAPHY</th>
<th>PHYSICAL OCEANOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.J. Pierson, City College of N.Y.; R.L. Bernstein, Scripps Inst. of Oceanography</td>
<td>extreme wave groups</td>
<td>extreme wave groups</td>
<td>extreme wave groups</td>
</tr>
<tr>
<td></td>
<td>directional spectra measurements</td>
<td>directional spectra measurements</td>
<td>directional spectra measurements</td>
</tr>
<tr>
<td></td>
<td>eddies, fronts, jets in the California Current</td>
<td>eddies, fronts, jets in the California Current</td>
<td>eddies, fronts, jets in the California Current</td>
</tr>
<tr>
<td></td>
<td>tidal characteristics of the Sacramento River</td>
<td>tidal characteristics of the Sacramento River</td>
<td>tidal characteristics of the Sacramento River</td>
</tr>
<tr>
<td></td>
<td>mid/deep-water circulation measurements</td>
<td>mid/deep-water circulation measurements</td>
<td>mid/deep-water circulation measurements</td>
</tr>
<tr>
<td></td>
<td>applications of satellite altimetry</td>
<td>applications of satellite altimetry</td>
<td>applications of satellite altimetry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACOUSTIC REMOTE SYSTEMS</th>
<th>ACOUSTIC REMOTE SYSTEMS</th>
<th>ACOUSTIC REMOTE SYSTEMS</th>
<th>ACOUSTIC REMOTE SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>J. Syck, Naval Undersea Systems Center; S.G. Chamberlain, Raytheon Company</td>
<td>acoustic sensing for sea floor classification</td>
<td>acoustic sensing for sea floor classification</td>
<td>acoustic sensing for sea floor classification</td>
</tr>
<tr>
<td></td>
<td>mapping of internal</td>
<td>mapping of internal</td>
<td>mapping of internal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSTER SESSION</th>
<th>POSTER SESSION</th>
<th>POSTER SESSION</th>
<th>POSTER SESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany International— Precision Components</td>
<td>Bren-Tronics, Inc.</td>
<td>Custom Cable Company</td>
<td>Endeco, Inc. (E.S.A., Inc.)</td>
</tr>
<tr>
<td>Bathysystems</td>
<td>Bruel &amp; Kjaer Instruments, Inc.</td>
<td>D.G. O'Brien, Inc.—Heckerman</td>
<td>E.S.A., Inc.</td>
</tr>
<tr>
<td></td>
<td>Conference Book Service, Inc.</td>
<td>Edo Corporation/Western Division</td>
<td>Giannini Petro Marine— Heckerman</td>
</tr>
<tr>
<td></td>
<td>Cross-Line Mfr., Inc.—Heckerman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Technologies Sessions – 1:20 p.m. to 3:00 p.m.</td>
<td>General Technologies Sessions – 3:20 p.m. to 5:00 p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POLYMETALLIC SULFIDES 1</strong>&lt;br&gt;P. Rona, NOAA/Atlantic Labs; R. A. Koski, U.S. Geological Survey&lt;br&gt;• overview &amp; evolutionary history of deposits&lt;br&gt;• PMS discoveries on the East Pacific Rise, Atlantic Ocean, Indian Ocean &amp; Juan de Fuca Ridge&lt;br&gt;• Atlantis II deep project</td>
<td><strong>POLYMETALLIC SULFIDES 2</strong>&lt;br&gt;P. Rona, NOAA/Atlantic Labs; R. A. Koski, U.S. Geological Survey&lt;br&gt;Additional papers on polymetallic sulfides including motion pictures of Atlantis II deep operations&lt;br&gt;&lt;br&gt;<strong>INTERNATIONAL OTEC</strong>&lt;br&gt;J. Vadus, OTEC Prog. Man. Off., NOAA; L. Vega, E&amp;G&lt;br&gt;&lt;br&gt;<strong>WASTE DISPOSAL</strong>&lt;br&gt;W. Lee, Roy F. Weston, Inc.; C. Chen, SYSTECH Engineering, Inc.&lt;br&gt;• multi-media management of disposals&lt;br&gt;• discharge permit program&lt;br&gt;• dredge material sitting strategy&lt;br&gt;• bioassays of contaminated soils&lt;br&gt;• solids distributions near marine discharges&lt;br&gt;&lt;br&gt;<strong>FISHERIES</strong>&lt;br&gt;R. Edwards, Northeast Fisheries Center, National Marine Fisheries Service&lt;br&gt;• application of engineering &amp; technology to the fishing industry&lt;br&gt;• shellfish &amp; shrimp fisheries&lt;br&gt;• testing of fishing trawls&lt;br&gt;• management of seafood processing wastes</td>
<td><strong>reports from France • Japan • the Netherlands • Sweden • Russia • United States</strong>&lt;br&gt;<strong>EXPLORATORY DRILLING – R.E. Haring, Exxon Product Research Co.; R. Geminder, Eng. Analysis Group, Hughes Offshore&lt;br&gt;• ice-breaking drilling barges&lt;br&gt;• safety aspects of offshore drilling&lt;br&gt;• spud gun joint analyses&lt;br&gt;• dynamic behavior &amp; fatigue analysis of marine risers</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **UNDERWATER ENGINEERING**<br>H. Tallow, Naval Ocean Sys. Can.; L. Lemaire, Naval Ocean Sys. Can.<br>• shear modulus measurements<br>• instrumented sea-bed penetrometers<br>• flow energized electrical generators<br>• cathodic protection devices | **DIVING & LIFE SUPPORT SYSTEMS 1**<br>T. Odum, Naval Coastal Sys. Can.; R. Garahan, Sub. Dev. Grp. 1, USN<br>• diver thermal protection<br>• helmet speech unscrambling<br>• heart & lung problems in diving<br>• decompression sickness<br>• air embolism therapy<br>• CO₂ scrubbers<br><br>**DIVING & LIFE SUPPORT SYSTEMS 2**<br>W. I. Milwaukee Jr., Milwaukee Associates, Inc.<br>• government regulation of scientific diving<br>• physiological diver monitoring<br>• surface supplied equipment microprocessor in a hyperbaric environment<br>• CO₂ sensors in high pressure environments<br><br>**MOORINGS**<br>R. Swenson, Ocean Technical Div., National Space Techno Lab; N. Albertson – NCBC<br>• deep water compliant structures<br>• tension members<br>• cable dynamics<br>• fibre rope technology<br>• mooring maintenance systems<br><br>**COASTAL ENGINEERING**<br>D. Wells, Naval Eng. Command Staff; G. Magoon, U.S. Navy Corps of Engineers<br>• mitigation<br>• artificial reefs<br>• floating breakwaters<br>• capping of contaminated dredge materials<br>• OTEC pipe foundations<br>• laser hydrography<br><br>**SHIP SYSTEMS**<br>W. A. Skinner, Lockheed Ocean Systems<br>• marine propulsion systems<br>• motion compensation systems<br>• level indicating systems<br>• fouling in heat exchangers<br><br>**OPERATING & ENGINEERING INSTRUMENTATION**<br>J. Jaeger, Hydro Products; T. Dauphine, Div. of Physics, Nat. Res. Can., Canada<br>• sea stress & hydrodynamic pressure measurement<br>• time domain reflectometry<br>• oceanic fouling forecasts<br>• air deployment of moorings<br>• free fall oceanographic vehicles<br><br>**ARTIFICIAL INTELLIGENCE**<br>A. Rechnitzer, Naval Observatory; P. Bridge, International Search<br>• introduction to artificial intelligence<br>• supervision and control of unmanned, untethered vehicles<br>• learning systems<br><br>**SATELLITE REMOTE SENSING**<br>J. Gallagher, Naval Undersea Systems Center<br>• sea surface temperature measurement<br>• synoptic wind fields<br>• measurements of ocean internal waves by synthetic aperture radar<br>• marine applications of the ARGOS system<br><br>**DATA MANAGEMENT & RETRIEVAL**<br>W. A. Hughes, National Oceano- graphic Data Center, NOAA<br>• ocean pollution data information<br>• Canadian oceanographic data system<br>• NOAA satellite data system<br>• techniques for marine data entry & acquisition<br><br>**OCEANOGRAPHIC SHIPS & PLATFORMS**<br>R. F. Commons, Woods Hole Ocean. Inst.<br>• deep water towing technology<br>• gimballed type shear development<br><br>**POSTER SESSION**<br>Gould, Inc. – Defense Electronics Division<br>Heckerman<br>Hydro Products<br>Institute for Marine & Coastal Studies<br>Instrumentations, Inc.<br>Interocean Systems, Inc. | **OCEANS '83 BANQUET**<br>Speaker: Athestral Spilliaus<br><br>**JMR Instruments – E.S.A., Inc.**<br>Klein Associates, Inc.<br>Krups Atlas Electronik<br>LeBus International – Heckerman<br>Lockheed Missiles & Space Co., Inc.<br>Marsh McInnis, Inc.<br>Military Sealift Command<br>Motorola – Government Electronics Group<br>NOAA/NESSIS/Satellite Data Service Division<br>Ocean Data Equipment Corporation<br>Philadelphia Resins Corporation – Heckerman<br>Raytheon Ocean Systems Co. – Heckerman<br>RD Instruments<br>Schenectady Instrument Company<br>Sea Bird Electronics, Inc.<br>Sea Data – Heckerman<br>Sea Grant Marine Advisory Program **adget**
WEDNESDAY

Morning Sessions

FOCAL PROGRAMS

MINERAL RESOURCES & ENERGY
Dr. Claude R. Hocott, Gulf Universities Consortium
Dr. J. Robert Moore, Marine Science Institute
University of Texas, Austin
Improvements in the understanding of environmental effects on offshore production systems; programs for the near-term development of OTEC.

Programs dealing with development of cobalt-rich crusts, marine placer mining, and ocean-bottom imaging systems.

NON-MINERAL RESOURCES
Dr. William S. Gaither, College of Marine Studies, University of Delaware
Dr. Carolyn A. Throughgood, Asst. Dean, College of Marine Studies, University of Delaware
Papers on genetic engineering and nutritional biochemistry programs important for the advancement of mariculture.

CIVIL/MILITARY

OCEAN ENGINEERING
Rear Admiral John B. Mooney, Oceanographer of the Navy
Large and important ocean engineering programs being conducted by Navy, NOAA and Army Corps of Engineers laboratories.

TRANSPORTATION

Mr. John Wing, Boeing-Allen-Hamilton Inc.
Dr. Don Walsh, Institute of Marine & Coastal Studies, University of Southern California
Papers reporting on programs geared towards improving and modernizing the merchant fleet and facilities, including marine transportation research and development, port rationalization, intermodal transportation, productivity improvement.

OCEAN SCIENCE

Mr. Feenan D. Jennings, Texas A & M University
Large-scale programs within the category of ocean science, including programs in physical, chemical, and biological oceanography as well as sea floor science.

PRESIDENTS' AWARDS LUNCHEON

Seimac Limited
Simplex Wire & Cable Company - Heckerman
Sippican Corporation
Ocean Systems Division
Sonatech, Inc.
Tracor Marine, Inc.
TSK America, Inc.

Chair: J. Wenzel
OCEANS '83 Chairman
Blue Ribbon Panel:
Mr. Dayton L. Alverson, fisheries consultant
Mr. Neil Brown, Chairman, Neil Brown Instrument Systems
Dr. John Byrne, Administrator, NOAA
Mr. John E. Flippe, President, Texas A & M Research Foundation
Mr. Ronald L. Geer, Senior Mechanical Engineering Consultant, Shell Oil Co.
Prof. Ben C. Gerwick, Jr., Consulting Structural Engineer
Mr. Jon Lindberg, Mariculture Consultant
Dr. George Mechal, Vice President, Research & Development, Westinghouse
Prof. William H. Menard, Scripps Institute of Oceanography
Mr. Allen E. Schumaker, Chairman, American Hull Insurance Co.
RADM Edward Snyder, U.S. Navy, Ret.

The closing plenary session will bring the entire OCEANS '83 Conference into focus. This session will provide the framework needed to update the historic PSAC, Straton Commission and Marine Board reports that dealt with national and global efforts needed to explore, understand, and develop the oceans.

The update will be accomplished through presentations by members of the Blue Ribbon Panel. The basis for their update will be the papers presented in the preceding sessions of OCEANS '83, together with their knowledge of marine science, technology, and affairs.

In a concluding portion of this plenary representatives of Congress will comment on the panel's report and discuss possible implications for Congressional action.

CONFERENCE TOURS

BAY MODEL TOUR—SAUSALITO
Thursday, September 1, 9:30 a.m.-12:00 p.m., $12.50/person
A bus will be provided to take registrants to visit the San Francisco Bay Model. Built and operated by the U.S. Army Corps of Engineers, this dynamic model simulates the flushing and tidal actions which influence the San Francisco Bay and Sacramento River delta system.

TOUR OF THE GLORIFIER EXPLORE
Thursday, September 1, 10:00 a.m.-4:00 p.m., $45.00/person
A tour of the Glorifier Explorer including a visit and lunch at the California Maritime Academy has been arranged for the limited number of participants.

SELF-GUIDED TOUR OF OCEANOGRAPHY/METEOROLOGY CENTERS
Thursday, September 1, 9:00 a.m.-5:00 p.m., No Cost
Ocean Routes, Inc., of Palo Alto, will hold open house for participants from 8:00 a.m. to 10:00 a.m. The Fleet Numerical Oceanography Center at Monterey will be open to participants to visit from 2:00 p.m. to 5:00 p.m. Maps and directions will be provided at the OCEANS '83 registration desk.

OCS NON-ENERGY MINERALS WORKSHOP

The workshop will examine the needs and options available in setting discretionary terms and conditions for operating OCS hard rock leases under a new program proposed by the Secretary of the Interior which will permit exploration and development of a wide variety of non-energy mineral resources located throughout all U.S. offshore areas.

If you are interested in the workshop, please indicate your interest on the registration form or contact Dr. Michael J. Crückshank, OCS Non-Energy Minerals, 646 National Center, Minerals Management Service, Reston, Virginia 22092, tel: (703) 860-7471.

SPOUSAL TOURS

VICTORIAN HOME TOUR
Monday, August 29, 1983, 1:00 p.m.-5:00 p.m. (4 hours) $24.00/person
Visit original Victorian homes and mansions that show the pride and tradition long past. Metuchen is a restored and beautifully maintained, these homes provide a glimpse into the past of wealthier Franciscans who came to California from all walks of life. Tour includes guide or docent as well as tea and cookies at one of homes.

30 person minimum

SONOMA WINE COUNTRY TOUR
Tuesday, August 30, 1983, 8:30 A.M. - 5:30 P.M. (8 hours) $35.00/person
Touring to the famous California wine country, expert Dennis P. Martin explains the fine art of wine making from the effects of the climate on the grape variety and production techniques. Time will be visiting and tasting at each winery plus a catered buffet in one winery's picnic area. Tour concludes following a stroll through Sonoma's Historical Town Square where one may visit the stores and shops surrounding the Square.

30 person minimum

SHANGHAI EXHIBIT/DIM SUM/CHINATOWN TOWN WALKING TOUR
Wednesday, August 31, 1983, 8:30-12:30, (4 hours) $30.00/person
Experience the unique exhibit "Treasures from the Shanghai Museum: 6,000 Years of Chinese Art" with a docent tour conducted during hours the Asian Art Museum is closed to the public. The exhibit, featuring two hundred and thirty-two objects, each considered artistic treasure will be shown only three U.S. cities. Follow museum tour, a brunch will be served in a Chinese Restaurant featuring a variety of dim sum (Chinese pastries) for everyone to serve and enjoy. An experienced guide will explain the highlights of the town during the brunch after which you may enjoy the optional guided walking tour of Chinatown.

30 person minimum—preregistered purchase only

Tours not meeting 30 person minimum are subject to cancellation.
OCEANS '83 ADVANCE REGISTRATION FORM

To register for OCEANS '83 and all of the associated events complete this form in full. We strongly suggest that you photocopy the completed form and retain the original for your information. Send the completed form with payment to:

OCEANS '83
P.O. Box 70970
Sunnyvale, CA 94086

The conference staff will not be able to confirm all of your requirements for the conference unless the advance registration form is postmarked by August 12, 1983. Register early!

Registrant Information
A separate form must be completed for each registrant. Spouses will be welcome to the technical sessions and exhibit area. Please print your name and address and your spouse's name so that your identification badges are accurate. Indicate whether you are a session chairperson, speaker, and your membership(s) in a sponsoring and/or participating society or organization.

Registration Fees
Advance registration fees are indicated. Registration fees at the time of the conference will be $15.00 more. Regular registration includes the conference proceedings which will be produced and mailed after the conference. The package registration includes both the proceedings and admission to all of the social functions for the registrant. Joint registration for OCEANS '83 and IGARSS '83 (technical sessions and IGARSS '83 record only) is an additional $50.00 over and above the OCEANS '83 regular or package registration fee. You may register for a particular day of technical sessions. Students with current enrollment cards may register for one day or all three days of the technical sessions. Joint registration for students to OCEANS '83 and IGARSS '83 is also available.

Social Functions
Spouses and attendees with regular registration must indicate which of the social functions they plan to attend. The fees indicated are for each person. Tables for 8 persons may be reserved for any of the social functions.

Conference and Spousal Tours
The prices indicated for tours are per person. These tours are contingent upon the number of participants that register in advance. Signups may be possible at the time of the conference, but to ensure your space check the appropriate box indicating the number of people in your party and include payment with this form. If any tour is cancelled due to lack of registration all fees will be fully refunded.

OCS Non-Energy Minerals Workshop
You may reserve a space for this workshop by checking the appropriate box at the right.

Memberships
You may begin or renew a membership in the Marine Technology Society and/or the IEEE Oceanic Engineering Society by including the appropriate annual dues with your payment to OCEANS '83. Be sure to indicate which membership you are paying for by checking the appropriate box.

Total
Total all of the items for which you are enclosing payment. Make checks payable in U.S. dollars to "OCEANS '83."

Conference Registration
The OCEANS '83 registration table at the Hilton Hotel will be open during the following hours:
Sunday, August 28, 4:00 p.m. to 8:00 p.m.
Monday, August 29, 7:30 a.m. to 4:00 p.m.
Tuesday, August 30, 7:30 a.m. to 5:00 p.m.
Wednesday, August 31, 7:30 a.m. to 2:00 p.m.

People wishing to register in person should do so the day before the session or event they are interested in. Advanced registrants must check-in with the OCEANS '83 registration table to pick up their conference materials.

Hotel Reservations
All participants in OCEANS '83 will be responsible for making their own reservations for hotel accommodations at the San Francisco Hilton and Tower. To make reservations call your local Hilton Reservation Service Office (consult your white pages) or see your travel agent. In order to obtain special OCEANS '83 room rates, be sure to emphasize that you are registered for OCEANS '83.

Name:

Company Affiliation:

Street:

City, State, Zip:

Telephone Number ( )

Current Membership

- IEEE
- MTS
- Both IEEE & MTS
- Participating Organization:

- Session Chairperson
- Speaker
- Presenter
- Spouse to attend

Spouse's badge to read:

Regular: □ Member @ $95 □ Non-Member @ $120 $_____

Package: □ Member @ $135 □ Non-Member @ $160 $_____

Joint OCEANS '83/IGARSS '83 @ $60 $_____

One day only: □ Mon. □ Tues. □ Wed. @ $60 $_____

Student 1 day: □ Mon. □ Tues. □ Wed. @ $13 $_____

Student - 3 days OCEANS '83 @ $25 $_____

Student - OCEANS '83/IGARSS '83 @ $35 $_____

Chairman's Luncheon, Mon. 8/29 #____ @ $15 $_____

OCEANS '83 Banquet, Tues. 8/30 #____ @ $25 $_____

President's Award Luncheon, Wed., 8/31 #____ @ $15 $_____

Bay Model Tour #____ @ $12.50 $_____

Glomar Explorer Tour #____ @ $45 $_____

Oceanography/Meteorology Center Tour: #_____ Res.

Victorian Home Tour #____ @ $24 $_____

Sonoma Wine Country Tour: #____ @ $36 $_____

Shanghai Exhibit Tour: #____ @ $30 $_____

□ Reserve #_____ for OCS Non-Energy Minerals Workshop

MTS: □ New □ Renewal @ $35 $_____

IEEE & OES: □ New @ $80 □ Renewal @ $65 $_____

Amount: $_____

Date: ___________ Check #________

Cashier: ___________ Total $_____

For office use only

Refund Policy
Refunds in full will be made for any reason until August 12, 1983. All refunds requested after August 12, 1983 will be subject to a 10% administrative fee. No refunds will be made after the conference commences unless for medical or other emergencies, at the sole discretion of the conference committee.

Program Changes
This advanced program is based on the best information available at the time of printing (4/83). All changes to the program will be reflected in the Final Program which will be available prior to the conference. For the latest program and registration information contact the OCEANS '83 office at the address above or telephone (408) 742-3104.

SAVE ON AIR COSTS
Special airfares for OCEANS '83 can be obtained on regularly scheduled airlines by booking through AIRCORP. These airfares are lower than supersaver and excursion fares. Call AIRCORP toll free at 800-520-0110. In New Jersey call 201-469-9530.
'TIS A PUZZLEMENT

NEW PUZZLES

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

PROPERTIES OF A PARABOLIC CURVE

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

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

PAST PUZZLES

Solution: Transformer Core Loss

A certain transformer winding has end terminals a and c and a midtap b. A wattmeter current coil is connected in series with a line to c. The voltage coil has a resistance of 2,000 ohms and is connected between b and c. An a-c voltage of 240 volts is applied between a and the outside terminal of the current coil. The wattmeter reading is 20 w. Compute the transformer core loss. Neglect the current coil loss.

The transformer and the wattmeter are connected as shown. As far as the wattmeter voltage coil is concerned, the current \( I_w \) is being supplied by a 2 to 1 stepdown autotransformer. Each half of the transformer has a current component of \( I_w/2 \), directed as shown. The inphase (or power) component of the exciting current is \( I_c \), directed as shown. Since the voltage coil circuit is largely resistive and the voltage across it is nearly 120 v, then \( I_w = 120/2000 = 0.06 \) amp. The inphase current through the current coil is \( I_c + I_w/2 = I_c + 0.03 \) amp. The power registered on the wattmeter is 120(\( I_c \) + 0.03) = 20 w as given. From this 120I\( _c \) = 20 - 3.6 = 16.4. The core loss is 240I\( _c \) = 32.8 w.

After the shift of the voltage coil connection the connection diagram becomes as shown. Here the inphase component of current through the current coil is \( I_c - I_w/2 \) amp. The wattmeter reading is 120(I\( _c \) - I\( _w \)/2) = 120I\( _c \) - 60I\( _w \)

From the previous problem 120I\( _c \) = 16.4. Then the wattmeter reading is 16.4 - 60 x 0.06 = 12.8 w.

Solution: Integer square and Cube Roots

Between 1 and 1,000,000, inclusive, the ten numbers whose square and cube roots are integers are 1\( ^{st} \), 2\( ^{nd} \), 3\( ^{rd} \), etc. The only one of these numbers that is between 500,000 and 999,000 is 9\( ^{th} \) = 531,441.

Solution: Properties of a Certain Curve

The curve \( y = C_0 + C_1x + C_2x^2 \) passes through the points (\( x_0 \), \( y_0 \)), (\( x_1 \), \( y_1 \)) and (\( x_2 \), \( y_2 \)), where \( x_1 = (x_0 + x_2)/2 \). Determine the values of \( C_0 \), \( C_1 \) and \( C_2 \) in terms of \( x_0 \), \( x_2 \), \( y_0 \), \( y_1 \), \( y_2 \) and \( y_1 \).
By substitution of values

\[ y_s = C_0 + C_1 x_0 + C_2 x_0^2 \]
\[ y_1 = C_0 + C_1 x_1 + C_2 x_1^2 \]
\[ y_2 = C_0 + C_1 x_2 + C_2 x_2^2 \]

When \((x_0 + x_2)/2\) is substituted for \(x_1\) and the resulting equations are solved simultaneously, the results are

\[ C_0 = \frac{(x_0 + x_2)(x_0 y_2 + x_2 y_0) - 4x_0 x_2 y_1}{(x_2 - x_0)^2} \]
\[ C_1 = \frac{x_1(-3y_0 + 4y_1 - y_2) + x_0(-y_0 + 4y_1 - 3y_2)}{(x_2 - x_0)^2} \]
\[ C_2 = \frac{2(y_0 - 2y_1 + y_2)}{(x_2 - x_0)^2} \]

The area \(A\) between the curve \(y = C_0 + C_1 x + C_2 x^2\) and the x-axis between the limits \(x = x_0\) and \(x = x_2\) is

\[ A = \int (C_0 + C_1 x + C_2 x^2) \, dx = C_0(x_2 - x_0) + C_1(x_2^2 - x_0^2)/2 + C_2(x_2^3 - x_0^3)/3 \]
CORRESPONDENCE

April 11, 1983

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

Dear Mr. Sabbagh:

Congratulations on your new job as editor. The Newsletter is great except for one inexcusable, the uncritical acceptance and reprinting of a piece of journalistic tripe about Tesla.

Tesla was a great man. It is unfortunate that of late he has been taken up by trendy technical incompetents who wade beyond their depth and swallow exaggerations, superlatives, and outright falsehoods as gospel. The piece you reprinted is a junior high school exercise beneath the professional level of IEEE. It is more error than truth and it does disservice to the memory of Tesla.

The AC motor was not solely Tesla’s creation. The idea surfaced independently in several places at approximately the same time. Tesla’s giant gift to mankind was the polyphase system of power generation and transmission. Though trained in mathematics he apparently never understood Maxwell’s equations and electromagnetic radiation, however this shortcoming was overcome by his unbridled imagination and he was still able to create novel and dramatic uses of electricity.

Tesla was a showman and a pet of society. He attracted the backing of people like J. P. Morgan with his pyrotechnics and his grandiose promises of spectacular things to come. Promises they remained and J. P. Morgan soon tired of sponsoring Tesla. As a result Tesla spent the last half of his life in impoverished straits.

When Tesla died at the age of 86 in 1943 the “New York Times” said: “His practical achievements were limited to the short period that began in 1886 and ended in 1903. And what achievements they were! Polyphase currents and alternating current engineering, the induction motor, the use of oil in transformers, remarkable work in wireless, electric arcs, gas discharge lamps. . . .”

“Yet all this he achieved to regard as of minor importance. It was the Jules Verne future that engrossed him, for which reason the last half of his life was spent in the isolation of a recluse. For forty years he lived in a world of fantasy crackling with sparks, packed with strange towers to receive and emit energy and dreamy contrivances to give utopian man complete control over nature. It was a lonely life. Shy of manner and ascetic in his tastes, Tesla always preferred his workshop to society. He never married. He ate sparingly and drank neither coffee or tea. On the other hand he regarded alcohol in moderation as virtually an elixir of life. It was his habit to stay up until daylight and then sleep only for a few hours before resuming his work.”

Tesla was tall and lean and preferred to dress formally in cutaway coats. He would never wear a necktie more than once. He had an almost abnormal attachment to pigeons. He also was an egomaniac. In a “Collier’s

Magazine” article by Tesla which appeared in Feb. 1901 the word, I, appears 61 times in two pages even though these pages are mostly covered with sensational photos of performing Tesla coils.

For all his strange ways he was a great man; but his feet were of clay like all the rest of us. Please keep things in perspective and do not launch or perpetuate untruths and exaggerations in a publication which carries the very sign of responsibility in its masthead, namely The IEEE.

Very Truly Yours,

Robert W. Merriam
Robert W. Merriam, Director
The New England Museum of Wireless and Steam, Inc.

4 April 1983

Miss Laura Christie
Conference Organiser
Science, Education and Technology Division
The Institution of Electrical Engineers
Savoy Place
London WC2R OBL
England

Dear Miss Christie:

The IEEE Oceanic Engineering Society would be pleased to accept your invitation to cooperate with you in your Fourth International Conference on ‘Energy Options—The Role of Alternatives in the World Energy Scene,’ to be held in London, 3-6 April 1984.

As a cooperating society for the Conference we will encourage OES members to submit technical papers to the Conference and promote the Conference in our Newsletter. To assist in this, I have appointed:

Dr. Joseph R. Vadus
U.S. Dept. of Commerce
NOAA Office of Oceanic Eng.
6010 Executive Blvd.
Rockville, MD 20852 USA
(301) 443-8655

to serve as a corresponding technical representative from IEEE/OES for future contacts.

Sincerely,

Stanley G. Chamberlain
4 April 1983

Mr. A. F. Spilhaus, Jr.
Executive Director
American Geophysical Union
2000 Florida Avenue, N.W.
Washington, D.C. 20009

Dear Mr. Spilhaus:

Per your invitation of March 9, 1983 and per my phon-con with Ann Greenglass on March 24, 1983, the IEEE Oceanic Engineering Society would be pleased to cosponsor the 1984 Ocean Sciences Meeting sponsored by the American Geophysical Union and scheduled to be held in New Orleans on January 23-27, 1984.

As a cosponsoring organization, we would publicize the meeting in our Newsletter and that we would incur no further financial obligation. Please provide meeting announcement/call for papers in a form appropriate for newsletter publication. Should you desire membership mailing labels, we can provide them to you at cost. I understand that in return, the IEEE Oceanic Engineering Society would be listed on the meeting literature and program, and that our members would be entitled to the same member registration fee as AGU members.

Thank you for the opportunity to participate with AGU in the 1984 Ocean Sciences Meeting.

Sincerely,

Stanley G. Chamberlain

---

**Antarctic Volcano Shows Unusual Amount of Activity, NSF Reports**

Scientists have recorded an unusual amount of seismic activity associated with Mount Erebus in Antarctica, the world’s southernmost active volcano, the National Science Foundation (NSF) reported.

The volcano has been monitored for three years by a team of scientists from the United States, Japan and New Zealand headed by Dr. Philip R. Kyle of the New Mexico Institute of Mining and Technology in Socorro.

The researchers had installed four seismic stations on the volcano—three on the slopes and one at the summit—under an NSF-funded program to check on its activities. NSF funds and coordinates all U.S. activities in Antarctica.

When the scientists returned for their annual field expedition in November, 1982, they found that the stations had recorded “an astonishing” 650 small earthquakes on October 8. Prior to that date an average of 20 to 80 such tremors had been recorded each day. The October 8 maximum was followed by 140 on October 9 and 120 on October 10. Dr. Kyle, who has just returned from Antarctica and made his report to the NSF, said some of the strongest earthquakes recorded during their three years of observation at Mount Erebus also occurred on October 8, although these earthquakes could not have been felt by people and registered less than 2 on the Richter scale.

A visual examination of the volcano showed there were no lava flows or other external signs of an eruption. The quakes, Dr. Kyle said, were caused by magma or molten rock that was moving within the earth just as it is believed it is doing at Mammoth Lakes in California, which recently has experienced a large number of earthquakes.

Dr. Kyle stressed that there is little, if any, chance that Mount Erebus would erupt. Unlike Mount St. Helens, he said, there is no pressure being built up in Erebus. He described Erebus as being in a state of “hydrostatic equilibrium”, an earth scientist’s way of saying there is no excess pressure present within the volcano.

Icy cold on the outside and fiery hot inside, Mt. Erebus is an unusual volcano and dominates the landscape visible from McMurdo Station, the principal U.S. scientific outpost in Antarctica.

Its crater harbors an exposed lava lake of molten rock 91.4 m in diameter. The lake, one of two active lava lakes in the world, is believed to be the top of the volcano’s magma chamber, a storage area for the molten rock within the mountain.

On their most recent expedition, the scientists observed the lake had dropped by about 3 m or lost about 300,000 cubic feet of lava since their previous visit a year earlier. Since the lava from the lake had to go somewhere, and there were no external signs of the molten rock, the scientists speculated that magma forced itself into a crack in the volcano and spread out like an arm from the magma chamber.

Dr. Kyle, an assistant professor of geochemistry, said the team hopes the seismic stations will provide them with enough information to determine the location and dimensions of the “arm” or dike as geoscientists call it.

Dr. Kyle explained that seismic waves are absorbed by magma but transmitted by solid rock. Therefore, the researchers can determine where molten rock is by looking at the pattern of the seismic waves. They already have used this technique to trace an artery of magma that appears to lead from the volcano’s magma chamber up to the lava lake.

Now they hope it will help them determine if a dike was formed on October 8 and to pinpoint its location if it does exist.
Shipbuilders Council Says U.S. Shipping "Relegated to Extinction"

In its newsletter of early last month, the Shipbuilders Council of America noted that on March 1 one American flag flying over the U.S. Capitol was flying upside down. This is one of the international distress signals at sea.

This accidental signal could not have been more symbolic, it was stated, concerning the U.S. commercial shipbuilding situation. Council President Edwin M. Hood, testifying before a subcommittee of the House Committee on Merchant Marine and Fisheries on the Fiscal Year 1984 Maritime Administration Authorization Bill, had this to say:

"In light of events of the past two years, the absence of any request for construction-differential subsidy (CDS) funding is not surprising. By decision and indecision, by word and action, the Administration has evidenced a disposition to relegate commercial shipbuilding in the United States to extinction.

"The fact that production facilities are being idled; the fact that shipyard workers are being laid off; the fact that the shipbuilding industrial mobilization base is being critically weakened and national security thereby endangered—these demonstrable facts are taking place while the Administration and the Congress ironically propose emergency measures to put people back to work, to reduce the present high level of unemployment.

"Jobs are being exported to shipyards and shipyard workers in other countries. The statements of Department of Transportation/-Maritime Administration officials in these respects have been truly unbelievable, mind-boggling, you might say: placement of contracts with foreign shipyards, in their view, will improve the competitiveness of U.S. shipyards, and even more, it is inferred that there will be a beneficial fallout for U.S. shipyards.

"Here is the 'beneficial' fallout: contracts for only three merchant-type vessels of 1,000 gross tons and over were awarded U.S. shipbuilders during 1982. None of these were cargo ships. At this moment, the U.S. orderbook comprises 21 merchant vessels, all of which are scheduled for delivery by the end of 1984. Thereafter, nothing!"

Admiral James L. Holloway, Ill. (USN-Ret.), President, Council of American-Flag Ship Operators (CASO), revived issues of foreign building rebuilding for subsidized operators and application of withdrawals from tax deferred Capital Construction Funds (CCF) for foreign ship construction, reconstruction or acquisition.

His statement included this sentence: "Representatives of United States shipyards and their allied industries have stated that, in the absence of CDS, no work will be lost to U.S. shipyards if the CCF program were extended to the 'build foreign' authority contemplated." When pressed to identify these representatives by name, he replied: "Ed Hood."

To which, Council President Hood later responded: "I can tell you that the position of our Board of Directors on the application of CCF withdrawals for foreign building, rebuilding or acquisition is unanimous. We have been and still are emphatically opposed to any such device to use tax-free U.S. dollars to subsidize the shipyards of other countries."

Oceanic Society Opposes Navy Plan to Sink Nuclear Submarines

A committee convened by the Oceanic Society, national marine conservation group, has criticized U.S. Navy plans to sink some 100 obsolete nuclear powered submarines off the U.S. coasts in the next 30 years.

The scientific panel warned that insufficient data was developed in the Navy’s Draft Environmental Impact Statement (DEIS) to proceed with the sea disposal option. Instead, scientists suggest a modification of the land disposal alternative considered in the DEIS to minimize release of radioactivity to the environment.

"A fundamental concern of Scientific Committee members centered on how little we know about the deep sea environment," Oceanic Society President Christopher Roosevelt said in releasing the panel’s report. "Compared to other ocean ecosystems, the deep sea is at best poorly studied."
POWER ENGINEERING (PE-31)
R. L. Hutter
Brown Boveri Electric, Inc.
Electrical Sales Division
P.O. Box 55328
Houston, TX 77055
(713) 666-6010

RELIABILITY (R-07)
Edward W. Early
(Treasurer)
Francois Envent
Man Tech. Inter. Corp.
2341 Jefferson Davis Hwy.
Arlington, VA 22202
(703) 979-0713

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

VEHICULAR TECHNOLOGY
(VT-06)
Cdr. R. H. Cassis, Jr.
17th CG Dist. EEE
U.S. Coast Guard
P.O. Box 3-5000
Juneau, AK 99802
(907) 586-7327

EX OFFICIO MEMBERS
Eric Herz
Irving Engelson*  
*IEEE Headquarters
345 East 47th Street
New York, NY 10017
(212) 705-7363
Robert E. Larson
26515 Anacapa Drive
Los Alidos, CA 94022
John C. Saecente
Telemec, Inc.
P.O. Box 2511
Houston, TX 77001
(713) 737-4500