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IEEE OCEANIC ENGINEERING SOCIETY

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President's Column

We had an excellent meeting of the Administrative in Houston on April 29. Secretary Steve Holt has provided details elsewhere in this Issue. We will have an Executive Committee meeting this summer about the time this issue hits the street, and a second meeting of the full Administrative Committee on November 5th in connection with OCEANS '01 in Honolulu. If you have items of business that we should take up, please let me or any of the Committee know. Their names, addresses, telephone numbers, and email addresses are in the Newsletter.

Congratulations to John Irza for establishing (or reestablishing) our Boston Chapter. He has assembled the necessary body of members and gained the necessary approvals. Well, done, John! BZ - BX.

Thomas F. Wiener

Speaking of Chapters, I wonder what makes it worthwhile to belong to a chapter and what is it about chapter activities that makes you return for each meeting. As a technical society, we tend to think of the technical content of the meeting as the primary draw. Clearly there must be a program of substantial interest on a regular basis to encourage our attendance, but in a society with a Field of Interest as diverse as ours, I think the networking that chapter meetings provide is the glue that holds the chapter together. In fact, the fact that we work in diverse but related fields seems to me likely to provide opportunities for some cross-cultural discussion. That is, we work on differing aspects of the same problem. Hearing the views, needs, and problems of engineers trying to achieve a common result but working at differing points in the common problem has been in my experience quite enriching, instructive, and rewarding, not to speak of helping me work more effectively. I would appreciate hearing from those of you who actively support chapters, if only (and I do not mean to minimize the contribution a person makes by "only" attending meetings) attending meetings. What sort of technical content would you like to have? What networking opportunities should chapter meetings provide?

Another satisfying experience that chapters can facilitate is a service project, such as sponsoring the local high school Science Fair, or providing docents at local museums, or providing tutoring support to local schools at any level. As you well know, working together for the good of the community and profession is rewarding beyond the effort expended. I plan to visit all our chapters during my tenure as President. I look forward to meeting those of you actively involved in chapter activities. I hope you will let me know how I can support your needs and wishes and how the society can use its resources, both tangible and intangible for your benefit and for the benefit of the profession.

Another item that your administration is wrestling is how to accommodate or take advantage of the move to electronic publishing. Our excellent Journal of Oceanic Engineering and Newsletter early in live become electrons. We are beginning to have the very real choice of delivery through the mail and via the Internet. Many societies offer a choice. This Newsletter is available on-line as well as by mail. Some publications publish continually on the World Wide Web, and annually or somewhat more frequently produce paper versions of what has been on the web since the last paper edition. I would like to have our publications be primarily delivered electronically. I recognize that some of you need paper versions, while most of you can take it either way. My preference arises from my easy access to a laptop and the web, which gives me compact storage for a lot of information. Unfortunately, the costs of each method of delivery are not well documented, because people are just starting to ask detailed questions. My vision, based on nothing but my own preferences and perceptions, is that the Journal and the Newsletter will be available on the web as a benefit of membership. For the small percentage of you who wish to have paper editions, we will provide them using a low volume print run and mail. Please let me know your preferences, and let me know why you feel that way. We will find a way to accommodate you.

I hope to see you all in Hawaii this November. An excellent technical program is in prospect, and getting together with friends and colleagues is always gratifying.

Thomas F. Wiener

Tom Wiener, President of OES flanked by Gloria and Joe Vadus, Vice President, OES and Judy and Cliff McLain. They were attending a Barbershop Quartet Concert, March 3 in Arlington, VA, directed by Tom Wiener, whose avocation over 20 years has been directing Barbershop Quartets.

Oceans 2001 booth at Oceanology International in Miami. Left to right: Liz Corbin, co-chair Oceans 2001, Bill Freidl, Oceans 2001 Technical Program, Judith Krauthamer, MTS Exectutive Director, Joe Vadus, Vice President IEEE/OES.

GREAT EXPECTATIONS: IEEE/OES Technical Activities

This annual editorial reports on planned conferences and offers some of my personal views on policy, which, of course, require AdCom review for possible adoption.

Conferences & Symposia

The next four OCEANS MTS/IEEE Flagship Conferences are progressing with great expectations.

Oceans 2001 (www.oceans2001.com); November 5-8 at the Hilton Hawaiian Village, a tropical paradise- combining papers and pupu's, Polynesian style. It's in season, so reserve early or you may have to commute from the outer islands. General Chairs are ADM. Thomas B.Fargo, Commander in Chief, US Pacific Fleet and Dr. Seiji F. Naya, Director, State of Hawaii's Dept. Business, Economic Development & Tourism. Liz Corbin and John Wiltshire who are the Executive Co-Chairs, along with a dynamic conference committee, are leading their Ocean Odyssey 2001. It promises to be a blockbuster—already over 500 abstracts, and many "satellite" meetings: US-Japan Cooperation in Natural Resources(UJNR) concurrent; Undersea Defense Technology UDT), Underwater Mining Institute, and Asia Pacific Biotechnology just before; and Armed Forces Communications (AFCEA) concurrent.

Joe Vadus

Underwater Technology 2002. Third time in Tokyo April 16-19, until another Pacific Rim venue materializes. A one or two day UT workshop in Taiwan may follow. The New Sanno Hotel operated by the U.S., provides all the amenities and Tokyo celebrates cherry blossom time. To see a great Web site check out <www.underwater.iis.utokyo.ac.jp/ut02/>. As a result of the OES Japan Chapter and the UT se-

ries, University of Tokyo established an Underwater Technology Research Center, directed by Prof. Tamaki Ura, past Japan Chapter Chair. "Brancart's" AUV series is still keeping options open for the next workshop.

Oceans 2002 in Biloxi, MS, the rapidly developing southeastern resort & casino town—less than one hour from New Orleans or the Stennis Space Center, a bustling complex of Navy, NASA, NOAA and supporting industry. General Co-chairs are RADM Thomas Q. Donaldson, Commander Naval Meteorological and Oceanographic Command and Herb Anderson, President of LOGICOM, who oversee a resourceful Conference Committee led by Rebecca Smith, Jerry Carrol and Jerry Boatman. The $600 Million Beau Rivage Resort & Casino Hotel is on the beach, and a short hop on a shuttle bus to the Mississippi Coliseum & Convention Center . "Call for Papers" this Fall and the conference is October 28-31. 2002. More on www.mtsgulfcoast.org.

Oceans 2003 in San Diego, a favorite recurring venue ('75, '85, '95, and why '03?). Well, Scripps Institute of Oceanography is celebrating its Centennial during the conference September 21-26, 2003. General Chairs are, Dr. Charlie Kennel, Scripps Director and Robert Wernli, who can guarantee success, along with Kevin Hardy of Scripps. Once again, a powerful team is on hand, with planning underway. The AGU-Ocean Sciences Conference is sharing The Town & Country Hotel facilities as a participating society, drawing additional participants for Oceans' sessions and exhibits. It promises to be a great celebration.

Oceans 2004 in Kobe, Japan combining the premiere US & Japan Conferences into "Oceans & Techno Ocean '04", supported by the OES Japan Chapter (our most active), the MTS Japan Section, the JAMSTEC and Kobe City. Japan's OES and MTS units have begun the planning process. Dr. Hiroshi Ohba, Chairman of JAMSTEC was proposed as General Chair, who served in that capacity for the past 3 Techno Ocean Conferences, and was recently selected for the 2001 MTS Compass International Award. OES and MTS participation headed by Professor Tamaki Ura and Professor Toshitsugu Sakou, respectively, have already begun the planning process.

Oceans 2005 and beyond are now being explored. It appears that '05 may be headed for the Washington DC area, after a long hiatus. We look for leadership and a proposal. Future offshore possibilities may include Norway, Germany (Hamburg), France (Brest), and Buenos Aires. Oceanic Engineering (OE) Symposium presents a possibility for even numbered years, offshore like UT, where a large exhibit is unlikely. I welcome your proposals for '05 and beyond.

Special Kudos: The Technical Committees, coordinated by Stan Chamberlain, continue to do a superb job in supporting the technical programs; and Journal Editor James Lynch and Newsletter Editor Fred Maltz maintain excellence in publications, and the publicity provided. All past OES technical publications will be on 3 CD's, as ably being orchestrated by Glen Williams. Thank you all for your valuable technical contributions.

Policy Issues for Consideration

Before offering my personal views on conference-related policy, it is important to note that a new OES Committee on Conference Policy (COCOPO) headed by Rene Garello, with strong support from Stan Chamberlain, Claude Brancart, Robert Bannon and Hisaaki Maeda is actively deliberating. MTS has been invited to participate. Refer to Pres. Thomas Wiener's outline of some of the key policy issues in the last newsletter. This committee's recommendations will be shared with MTS and presented to the AdCom for approval.

Multiple Annual Conferences: Some complaints continue on the proliferation of conferences and thinning out the availability of good papers and willing authors. How best can we compete and excel other conferences? I believe in a high quality annual Flagship conference at a desirable, rotating venue , as currently sponsored by MTS & OES, with all the " bells and whistles" (quality technical program, tutorials, exhibits, socials, related meetings et al) . When we are abroad, a domestic flagship conference can also be pursued … depending on the attractiveness of the proposals, and minimizing conflicts. We have been successful in pursuing symposia and workshops over the years without degrading the Flagship.

It is my belief that more could be done with a stronger focus on the annual Flagship conference. Our competitive posture will be weakened, unless a more aggressive stance is taken . We should first concentrate on our annual Flagship conference, because its growth potential ought to be fully exploited with better focus of human and financial resources, and adoption of some of the new policy recommendations, currently under review by OES & MTS. Inviting other societies to join with MTS/OES can be done in a simple, phased in approach. We are close to this approach by having many "participating" societies each year. The next step is to invite them to share the venue, including their name in the billing, adding their own sessions and a separate volume of the proceedings. MTS/OES would continue to manage and retain financial control, with contractor support for e.g., receiving papers, laying out the program, publications, registration, and managing the exhibit. There may be other opportunities for conference or symposia collaboration, e.g. with other IEEE societies such as Remote Sensing and Control Systems, each of which have an ocean component.

Annual Flagship Conference Enhancement

When launching a new conference, more "up front" planning with an experienced team is needed to :

- Select a prominent , respected Chair or Co-chairs, who may be able to draw a strong conference committee and access some additional support.
- Select technical program co-chairs, with a strong technical committee of track and session co-chairs appointed, when the "call for papers" is released, to assist in recruiting authors and planning the program. For example, Oceans 2001 received over 500 abstracts. The eight track approach, led by Stan Chamberlain and Marchand, for OCEANS '98 in Nice, organized an elite group of track and session chairs, with great results.
- Exhibitors should be solicited by Exhibit Committee members on a personal "one on one" contact basis. Form letters and contacts by Support Contractor staff is not enough.

- Need a good social program satisfying conference attendees, spouses and guests.
- The conference committee must operate using the MTS/OES Conference Guidelines, with one or two seminars to "walk " the committee through the guidelines.
- The core technical program should include the topics of the OES Technical Committees (12) and MTS Professional Committees (30). Each has an obligation to package at least one session for the annual Flagship Conference. Topics based on regional emphasis could be added at the Technical Program Committee's discretion.

Chapters: OES has ACTIVE chapters in Japan, Canada (2), France, Norway, Seattle, with New England, San Diego and Hawaii reactivating. In the Gulf Region (Stennis & Biloxi, MS area) there are EE's in NAVOCEANO, CNMOC, NRL, NASA, NOAA and supporting contractors , but little OES local support to call upon... ..and this imbalance was pointed out. My overall message is that chapters are vital for membership and provide a focal point to get together for tech exchange, networking and job opportunities; and providing an OES base for local support. To provide an incentive to strengthen chapters, I recommend that they be allowed, at the discretion of AdCom, to share up to 50 percent of OES's conference surplus, based on the extent of their support

Hear Ye, hear Ye: Your comments and ideas are welcomed, and I will pass them on to COCOPO and others.

Joseph R.Vadus
Vice President, Technical Activities

From the Editor

Panel of Technical Editor's Meeting

Expanded access to IEEE information was described at this year's "Panel of Technical Editor's Meeting" held in San Diego, March 30 & 31. One of the better known products developed under TAB by its Periodicals Committee is IEEE Xplore which is briefly touched upon below. The popularity of Xplore exceeded all expectations and has been a commercial success for IEEE. This and similar new products were also presented at this meeting plus an overview of TAB Publications operations and financial status. Some of the highlights of the meeting are outlined below:

I Summary of TAB Periodicals Committee Products

An Xplore update was presented by Scott MacFarland, Director of IEEE Publications Business Development. Xplore was launched by IEEE staff March 2000. It uses the INSPEC data base and is indexed by technical content. It contains 700 periodicals, and includes IEEE Spectrum, and Proceedings. Currently there are 671,000+ documents in PDF format.

Other products which are being developed by IEEE include:

(A) IEEE Tech Watch Alerting Service which has the purpose to provide a single concise source members can rely on to inform them of key information and events targeted to IEEE areas of interest.

(B) IEEE Technology Online which is a unified resource for searching and retrieving technical content from not-for-profit content creators using the IEEE Xplore platform.

(C) IEEE Job Site which will provide members enhanced access to a wide range of available positions, enhanced recruitment advertising opportunities for employers and revenue for IEEE Spectrum and participating IEEE Units.

(D) IEEE Portal which will enhance access to IEEE information by enabling customization of user views of IEEE Web space.

Frederick Maltz

II Publications Operations

Fran Zappulla, Staff Director IEEE Publishing, discussed the volunteer survey which showed a high level of satisfaction with IEEE Publishing services. The IEEE Editing/Composition system has recently been upgraded for the first time in ten years. They are now in an aggressive hiring mode and are working on the graphics compliance problem, data conversion accuracy and authoring tools for journals, conferences, and online peer review services to expedite submission to publication.

III Corporate Identity Standards for Periodicals

Fran Zappulla described the upshot of the recent branding study for displaying the IEEE logo on publications. The specifications have been laid down and the goal is incorporation by the first issue of 2002 or next redesign, whichever is sooner. (The new logo will be displayed on the OES Newsletter starting with the Spring 2001 issue).

IV Activities of P2SB - SPC (Publications Products and Services Board - Strategic Planning Committee)

This committee as indicated by John Baillieul, Chair TAB Transactions Committee includes the following members:

James Tien	Charles Rubenstein	Pete Morley
Leah Jamieson	Philip Wilsey	Allan Schell
Murray Eden	Michael Adler	Charles Robinson
John Baillieul	Roger Pollard	David Fogel
Peter Staecker	Friedolf Smits	

Their endorsed vision is to:

(A) Establish the IEEE as the producer, publisher, and provider of choice of high quality IPS (Information Products and Services) in the IEEE's Field of Interest.

(B) Establish the IEEE as the place to access relevant, focused, and validated technical and professional information in response to the needs and interests of the technical community.

To accomplish this they have formed Focus Groups for 2001 as follows:

(1) Expanded Access to IEEE Information.
(2) Strategic Business Models.
(3) Strategies for Peer Review Identity - Quality.
(4) P2SB Bylaws/Manual.
(5) Archiving Initiatives.

One of their actions is to review their 5 year plan at the May 2001 SPC meeting and to finalize it at the June P2SB meeting.

V Publications Sales

The IEL (IEEE/IEE Electronic Library), which includes journals, magazines, conference proceeding and IEEE standards publications dating back to 1988, sales for the year 2000 was $20M and for the year 2001 is forecast to be $28M.

The APP (All Periodicals Package), which includes IEEE journals with a two year backfile, sales for the year 2000 was $.59M with budget of $2.7M for the year 2001. POP/POP All Online Proceedings Order Plans Online), which includes IEEE Conference Proceedings with a two year backfile, sales for the year 2000 was $.18M with budget of $.85M for the year 2001.

VI The Publishing Competitive Environment

Sci/Tech Publishing (about 1/3 of total Publishing) is a $4 billion market place. The IEEE is ranked 9th in sales at $85 million per year. The market leader (Reed-Elsevier) in the area of science, law, and business had total sales over $5 billion with $1.2 billion in profit all of which is being invested in online publishing for the years 2000 to 2002.

VII Newsletters/Magazines Session

Sharon Nadler of IEEE accounting discussed accounting statements which can now be read online at society web pages. She also mentioned that advances are available for editors office operating expenses.

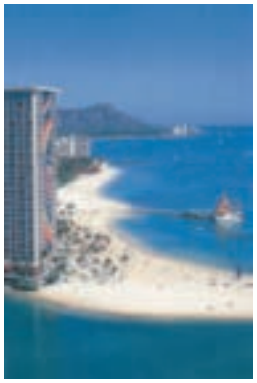
Other items discussed included cross society marketing for magazine subscriptions by trading ads. Some societies are setting up booths at trade shows that are not directly related to their society for the purpose of marketing their society magazines and membership. There is cooperation between societies for mailout. Some are polybagging their periodicals to save on mailing costs. The cost of print advertising is going down because of the reduced exposure as the result of migration to the internet. Advertising charges are posted on the internet.

VIII Dinner Speaker

Anthony Durniak, IEEE Publications Staff Executive gave a presentation entitled "Using 21st Century Tools For A Centuries Old Mission: The Role of Learned Societies Moving to Electronic Publishing for Science". In it he pointed out some of the new challenges faced by the IEEE, including making adjustments to the openness and egalitarian nature of the internet and dealing with its new business model and commercial aspects. He gave some concrete examples of new competition created by the internet, namely dot.com startups and comercial publishers such as VerticalNet (http://www.verticalnet.com), BioMedNet (http://www.bmn.com), Chemweb (http://www.chemweb.com), and Engineering Village (http://www.ei.org) courting "members". He ended with the appeal that "Together We Can Succeed" in making IEEE Publications essential information for engineers.

MTS/IEEE OCEANS 2001

November 5-8, 2001
Hilton Hawaiian Village
Honolulu, HI



The setting for OCEANS 2001 will be a place whose culture is unique not just in America but also in the world. The multi-ethnic population of Hawaii sets a positive standard for international harmony and understanding. Hawaii's business and cultural climate is stimulating. The environment is empowering. And, at a time when security is a consideration, it's worth knowing that Honolulu is one of the safest large cities in America.

Typically more than six million people from around the world come to the islands each year. Over half a million annually attend conferences, forums, and trade shows in Honolulu and at locations throughout the state. Honolulu's unique location serves as a travel hub and makes

things simple. There is no better location for a convention whose delegates will be coming from Asia Pacific and America. Travel time from the West Coast is about five hours. Travel from the East Coast takes a few hours longer. But, as many who have come here will agree, Hawaii is well worth the trip.

The Hilton Hawaiian Village is located on a beautiful sandy beach in Waikiki. The property is a deluxe hotel and offers many amenities. The hotel units have central air conditioning, an honor bar, a refrigerator and color cable television. Units in the Lagoon Tower have fully equipped kitchens and cable television as well as access to the private pool for the Lagoon Tower guests The Hilton Hawaiian Village has several pools, restaurants, lounges, and water sport equipment rentals. This is a self-contained village where a guest never has to leave to take a relaxing tropical break. This unique location is great for speakers, exhibitors and attendees. The large and comfortable meeting rooms are convenient to the exhibit hall, and there are ample areas to meet for discussions over a cup of coffee, drink or a meal.

As honorary co-chairs, Dr. Seiji F. Naya, Director Hawaii Department of Business, Economic Development & Tourism and Admiral Thomas B. Fargo, Commander in Chief, U.S. Pacific Fleet extends an invitation to attend OCEANS 2001 MTS/IEEE at the Hilton Hawaiian Village in Honolulu, Hawaii. An outstanding agenda will focus on technical advances, economic potential and military and industrial needs for the future.

The conference schedule is set with ample time to view the exhibits during morning and afternoon coffee breaks. This will assure plenty of time to meet conferees, exchange ideas, show products and discuss sales.

Technical tutorials will provide information to a wide range of scientific interests. As an example the Marine Corrosion Engineering session by Jim Jenkins will cover corrosion fundamentals applied to the design, construction, operation and maintenance of structures and equipment that will be used in marine environments. The attendees will be given a better understanding of the fundamentals of corrosion that will improve their ability to understand the corrosion literature, to communicate with experts in marine corrosion, to better integrate corrosion control into system design, to improve their ability to make field changes when required and decrease the likelihood of unnecessary corrosion failures. Emphasis will be placed on the mechanisms of corrosion in marine environments, the forms of corrosion commonly encountered in marine systems, the characteristics of marine environments that influence corrosion, the methods that can be used to control corrosion in marine systems, and the integration of corrosion control into system design.

Oceans 2001 Tutorials

T1 (1/2 Day)

Life Raft and Emergency Distress Signal Training
Dr. Robert N Yonover and Lt. Com Ed McCauley (USCG, ret.)

Abstract:

The Life Raft and Emergency Distress Signal Training Tutorial is a 1/2 day session that will familiarize seagoing researchers with the use of the emergency equipment that is commonly aboard their vessels. Unfortunately, most survivors will attempt to use their rafts and distress signals only when they are placed in a serious situation - without any prior training which could make a difference between surviving and perishing from a mishap on the ocean. Two experts in Life Raft and Emergency Signaling Technologies will provide Tutorial participants with a hands-on experience in order to provide them with the knowledge they need to survive an emergency situation at sea. Skills covered in the tutorial will include: Life Raft inflation/deployment/boarding, Flare activation, Signal Mirror use, SEE/RESCUE Streamer deployment, EPIRB overview and activation, Fresh Water Pump instruction, and Survival Skills (Diet/Fishing/Psychology).

T2 (2 - 1/2 days)

Synthetic Aperture Sonar
Marc Pinto
Enson Chang
Part I - Morning - Marc Pinto

Outline

Synthetic aperture processing is a critical technology for radar which is now close to being mature for sonar for applications, such as mine detection and seafloor mapping.

The tutorial will first review Synthetic Aperture Sonar (SAS) design criteria. The Synthetic Aperture Radar (SAR) design, which uses the same transducer for transmission and reception, will be briefly discussed, chiefly to show its limitations in high resolution sonar applications. This SAR design leads to a compromise between along-track resolution and area coverage, which is most often unacceptable in sonar. The SAS design, which uses a transmitter and a multi-element receive array, will then be introduced. The relations between the along-track resolution, area coverage and the characteristics of the transmitter and receiver array will be reviewed. The criterion for the spatial sampling of a SAS will be established. An advanced SAS design, known as multi-aspect SAS, will be introduced and its relation to the well-known SAR modes of operation, such as squint SAR and spotlight SAR will be discussed as well as the combination of SAS with depth finding using interferometric sonar.

The most difficult limiting factor to synthetic aperture imaging quality is the defocusing due to unknown motions of the sonar platform. Micronavigation is introduced as the problem of estimating, with the required sub-wavelength precision, the platform motion during the SAS integration time. Many of the SAS results obtained have made use of data-driven micronavigation techniques based on the Displaced Phase Center Antenna (DPCA) principle. An intuitive understanding of the DPCA will be developed. Then theoretical results on DPCA micronavigation accuracy, including the impact of calibration errors, will be presented. The possible use of inertial instrumentation and optimum filtering for further improvements in micronavigation accuracy will be discussed.

The tutorial will be illustrated by simulations as well as numerous results for several at-sea experiments, done in the framework of a collaborative multi-national Joint Research Program coordinated by the NATO SACLANT Undersea Research Centre. These include experiments done on underwater rails as well as an ocean-going SAS demonstrator which features a 100 kHz multi-aspect SAS mounted on a passive towbody.

Addendum Course Description

Part 2 (afternoon – Enson Chang) of the tutorial will address issues germane to long- and very long-range SAS imaging. Motion compensation alone becomes insufficient when the imaging range is larger than couple of hundred meters. Propagation effects (e.g., sound speed variations induced by turbulence and internal waves, rough surface and bottom scattering) set in and can affect image quality drastically. Long-range SAS results to date suggest that it is essential to employ the so-called "autofocusing" techniques, once again derived from the radar community, to mitigate the effects of medium fluctuations as well as residual, uncompensated platform motion error.

In this half of the tutorial we will review long-range SAS imaging results, including images taken from several hundred meters up to several tens of kilometers in range. We will discuss the pertinent medium fluctuation mechanisms in different frequency regimes and their characteristics in relation to SAS processing. A number of autofocusing techniques which have been successfully applied to SAS processing, including the map-drift algorithm, the phase gradient algorithm (PGA), and more advanced variants of PGA such as the 2D stripmap phase curvature algorithm, will be presented.

Besides medium characteristics there are other fundamental differences between short- and long-range SAS imaging, including viewing angle differences, multipath filling-in of object shadow, and frequency-dependent target response. These topics will also be discussed in this tutorial.

Although long-range SAS processing has been perceived as computationally-intensive, it has become feasible even within the realm of COTS technology. We will discuss a basic real-time SAS system architecture and the processing and memory requirements for various applications.

T3 (1/2 day)

Introduction to Marine Corrosion Engineering
Jim Jenkins

Abstract

Corrosion is a frequent cause of failure of marine systems and contributes heavily to maintenance and repair requirements for marine systems. Marine engineers and scientists frequently do not receive instruction in corrosion engineering as part of their educational curriculum. This tutorial is intended as an introduction to corrosion control for marine systems.

This tutorial will present the fundamentals of corrosion applied to the design, construction, operation and maintenance of structures and equipment that will be used in marine environments. The attendees will be given a better understanding of the fundamentals of corrosion that will improve their ability to understand the corrosion literature, to communicate with experts in marine corrosion, to better integrate corrosion control into system design, to improve their ability to make field changes when required and decrease the likelihood of unnecessary corrosion failures. Emphasis will be placed on the mechanisms of corrosion in marine environments, the forms of corrosion commonly encountered in marine systems, the characteristics of marine environments that influence corrosion, the methods that can be used to control corrosion in marine systems, and the integration of corrosion control into system design.

The materials provided with the tutorial will consist of an outline text that can be used by the attendees to make systematic notes during the lecture and copies of the visual aids that will be used in the presentation.

T4- (Full day)

Applied Digital Signal Processing in Acoustics
Dr. Jim Candy

INTRODUCTION

This short course is designed to develop, conceptually, digital signal processing (DSP) techniques that are applicable to many acoustical signal processing problems. The discussions range from basic digital signal processing techniques such as digital filtering and the fast Fourier transform (FFT) to more advanced approaches such as spectral estimation and adaptive processing to some of the even more sophisticated adaptive and model-based techniques. The intent is to provide an overview that will enable the participant interested in more details of a particular approach to investigate them through primary references provided. At each stop along the way we will apply the technique to an acoustical application. The participant will obtain a basic understanding of the approaches and their applicability discussed from the practictioner's perspective, rather than that of a DSP expert.

GOAL

To provide the participant with an overview and conceptual development of a suite of digital signal processing techniques that are useful for acoustical applications along with a road map to acquire more specific details of the particular approaches.

TOPICS

The topics to be discussed will include the following:

- Basic digital signal processing (digital filters, FFTs, sampling, etc.)
- Deterministic to stochastic representations (impulse and white noise responses, correlation, finite impulse response models, autoregressive models, etc.)
- Spectral estimation (classical correlation methods to modern parametric methods) — [biomedical application]
- Parametric signal processing (filtering, spectral estimation using models, etc.) — [biomedical application]

- Time delay estimation (cross-correlations, optimal approaches, modeling approaches, etc.)—-[ultrasound flaw detection application]
- Adaptive signal processing (filtering, spectral estimation, noise cancelling, etc.)—-[laser ultrasound application]
- Array signal processing (space-time processes, beamforming, matched-field, etc.)—-[ocean acoustic application]
- Model-based signal processing (state-space and gauss-markov models, kalman filters, etc.)—-[vibrating structures application]

T5- (1/2 day)

New Technological Developments for Undersea Exploration
Thomas K. Dettweiler

A brief summary

This tutorial will be a discussion of the development and application of new technologies to the world of undersea exploration. Topics will include the use of available software tools and the internet for both pre-mission and post-mission planning, analysis, and product optimization. A large portion of the discussions will include applications of the newer technologies, including Autonomous vehicles in the field, and discussions of the future direction these technologies are leading. Looking to other disciplines for technologies which can be applied to the ocean and the increased availability of complex, but inexpensive off-the-shelf technologies are encouraging rapid developments in the field of Undersea Exploration. Also discussed will be taking advantage of the new technologies to speed the processing, delivery, and value of the final products to the customer.

T6- (Full Day)

Ocean Acoustics
William. A. Kuperman, Michael. B. Porter and Henrik Schmidt

Material to be used in the course

"Computational Ocean Acoustics" by Finn. B. Jensen, W. A. Kuperman, Michael B. Porter and Henrik Schmidt, Springer-Verlag, 2nd Printing February 2000.

Supplementary notes to be handed out

This course is designed for people who are interested in the Ocean Technology area and would like to know more about Ocean Acoustics and Signal Processing. A technical background of Basic Physics and Calculus would be helpful.

Instructors: all are active researchers in Ocean Acoustics and Signal Processing.

W. A. Kuperman: Professor and Director of the Marine Physical Laboratory, Scripps Institution of Oceanography, Univeristy of California, San Diego

M. B. Porter, Science Applications International Corporation

Henrik Schmidt, Professor, Department of Ocean Engineering, Massachusetts Institute of Technology.

The purpose of this course is to give as intensive an introduction into the area of ocean acoustics and signal processing as is possible in one full day. The course should be of interest to people who would like to: understand more about the underlying principles of sonar. understand how ocean acoustic instruments work; know more about how acoustic predictions are made; interpret the results of acoustics models or predictions (including units); understand how ocean sounds from marine animals propagate; understand how acoustic arrays perform in complex ocean environments; understand the basics of matched field processing; know more about the technical issues of ocean acoustic communications; know more about hydroacoustics with respect to the Comprehensive Test Ban Treaty

T7- (1/2 day)

Hydrodynamics, Dynamics, and Control of AUV 's
Dr. Douglas E. Humphreys

Presentation Summary

This seminar will emphasize the practical aspects of hydrodynamics, dynamics and control of undersea vehicles. The objective is to provide a brief survey of the current modeling methodology and then present a detailed treatment of undersea vehicle dynamics. Attendees will come away with a better understanding of the concepts used in modeling and simulation of undersea vehicles. Approaches for estimating coefficients for hull, fins and fin-hull combinations will be covered. The use of Bode plots and root locus to gain insight into vehicle design trends will be demonstrated. The tradeoff between stability, control, and steadiness will be discussed along with design examples. In addition to handouts of the presentation slides, each attendee will receive a comprehensive bibliography covering the subject area.

T8- (1/2 day)

New Developments in Electronic Navigation
Dr. Lee Alexander

ECDIS – What is it, How does it work, and Why is it im - portant?

ECDIS (Electronic Chart Display and Information System) is a new technology that provides significant benefits in terms of navigation safety and improved operational efficiency. More than simply a computer display, an ECDIS is a real-time navigation system that integrates a variety of chart and navigation-related information that is displayed and interpreted by the Mariner. As an automated decision aid capable of continuously determining a vessel's position in relation to land, charted objects, aids-to-navigation, unseen hazards, and other vessels, ECDIS represents an entirely new approach to maritime navigation.

A one-half day tutorial session will provide an overview of **what** is this new type of shipboard navigation system, **how** does it work regarding its functional capabilities, and **why** is it important in terms of safety of navigation and improvements in operational capability. This session will also address national and international aspects associated with the implementation of this new navigation system. Additional emphasis will focus on the use of ECDIS-related technologies for both civil and naval maritime operations. Topics to be covered will include:

- the different types of electronic charting systems
- performance standards and specifications (e.g., IMO, NATO, US Navy)
- functional components and sub-systems

- electronic chart data and required services
- display aspects (e.g., colors and symbols)
- integration with other sensors (e.g., GPS, radar/ARPA, AIS), etc.)
- capabilities and limitations
- regulatory and legal aspects
- policy issues and training

Presented primarily as a series of MS PowerPoint presentations, this session will also include simulations and demonstrations of electronic chart data, functions, and systems. Attendees will be provided a tutorial session print-out and a CD.

Soundings

Welcome to the second installment of the new "Soundings" column. This column reports on a broad spectrum of news items from the mainstream media that relate to Ocean Engineering technologies. The purpose of this column is to inform the ocean engineering community of our impact in the media while giving us insight into how our industry is perceived by the general public.

German WWII Sub Found in Gulf

While surveying the floor of the Gulf of Mexico for an oil pipeline route, BP and Shell Oil Co. discovered the wreck of the U-166, which sank in 1942 after it destroyed an American ship.

"This is the find of a lifetime. It really is," said Robert Church, a marine archaeologist with C&C Technologies, which identified the wreckage in March. Video taken May 31 and June 1 confirmed the find, which lies about 45 miles from the mouth of the Mississippi River in about 5,000 feet of water.

The U-166 made its mark in the history books by sinking the American passenger-freighter Robert E. Lee in late July 1942. U-boats sank 56 merchant ships in the Gulf of Mexico between 1942 and 1943, including the Robert E. Lee at the end of July 1942. http://www.gomr.mms.gov/homepg/regulate/environ/archaeological/shipwrecks.html

John Irza

Cheetah Slinks to the Sea

Russia is reportedly sea testing a nuclear-powered sub believed superior in many ways to some of America's best subs. The Gepard (Russian for cheetah) it is expected to begin active duty with the Northern Fleet as early as July, after it passes its trials, according to Russian news reports. U.S. sub experts suspect the Gepard may move as fast and as quietly as America's best fully operational subs, the Los Angeles-class subs, as well as have the capacity to dive deeper and to harness more firepower.

"In many respects, it's a superior submarine," says independent submarine expert Norman Polmar. "We know it's at least as quiet as an improved LA's. Whether it's quieter I can't say."
Reprinted from http://freerepublic.com/forum/a3b20fe5f2c66.htm

Mo Better Access

The USS Missouri is getting a High-Tech makeover to offer "virtual" tours of the floating museum, accessible both from the main deck and classrooms around the world.

"Mighty Mo" will be wired with 35 miles of high- speed cable linking nearly 200 video cameras around the ship to an onboard control center providing sound and images to 30 information kiosks.
http://www.islandpacket.com/24hour/technology/story/487848p-528426c.html

Teed-off? Just add water!

Eco Golf, manufacturer of the Eco Golf Tee, has announced the development of a golf ball that will dissolve safely in water. Driving golf balls into the ocean was a favorite pastime of many cruise line passengers but today this practice violates MARPOL regulations that state that no plastics are allowed in our oceans. Eco Golf has developed a ball that looks, feels and flies like a real golf ball. The Eco Golf Ball is made from 100% natural materials and can actually be consumed by marine life. This eco-friendly golf ball will degrade within 3-5 days leaving no synthetic or toxic residues behind; in fact, the ball is as safe as table salt.
http://www.ecogolf.com/balls.htm

If you see an article (whether in print or in electronic form) that you would like to see mentioned in this column, please let me know by email, fax, phone, or regular mail. Email contributions can be sent to a special address: Soundings@ Sygnus.Com. Information for phone, fax, and regular correspondence can be found in the back of newsletter where I am listed in the AdCom section.

John Irza

UJNR
Marine Facilities Panel

24TH UJNR MFP MEETING

You are invited to participate in the 24th meeting of the Marine Facilities Panel (MFP) of the United States Japan Cooperative Program in Natural Resources (UJNR). The meeting will be held November 4–12, 2001 in Honolulu, Hawaii. The MFP consists of senior-level engineers, scientists, and managers from the U.S. and Japan who are involved in advanced technology associated with the research, design, development, evaluation, and operation of marine facilities for a wide variety of applications in the assessment, development, utilization, and management of the oceans and their resources.

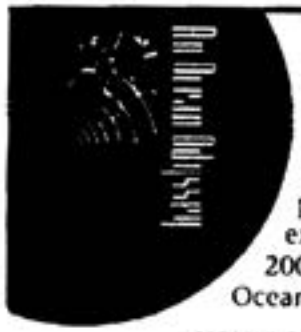
The purpose of the UJNR is to build technical cooperation and exchange of information. The MFP's scope of technical topics is broad and includes: ocean and coastal engineering; facilities and techniques for ocean resource exploration and development; shipbuilding and marine transportation; undersea systems, submersible, and remotely operated vehicles; ocean space utilization; seafloor engineering and offshore construction; port and harbor facility development; ocean environmental measuring and observational systems; and pollution and waste management systems.

All details of the 24th UJNR MFP Meeting, including the U.S. preliminary itinerary and the suggested study tour of marine facilities and projects, are described on the Marine Facilities Panel web site:

www.dt.navy.mil/ip/mfp

The completed proceedings for the last UJNR MFP (23rd) meeting are also available at this website.

Each participant must understand that this is a no-host meeting and he/she is responsible for all meeting expenses. Participant expenses include registration fees, travel, hotel, meals, local transportation, etc.



The 24th MFP meeting will join the Oceans 2001 annual meeting sponsored by the IEEE Oceanic Engineering Society and Marine Technology Society. We will participate in the opening session, exhibits and luncheons at the Oceans 2001 Conference. The website for the Oceans 2001 conference is:

www.oceans2001.com

Prospective authors are invited to submit abstracts to the technical session chair no later than 1 May. The final paper is due 1 September 2001. Instructions to authors are available on the UJNR MFP website:

www.dt.navy.mil/ip/mfp

Please contact the technical session chair for questions regarding technical papers:

OCEAN ENGINEERING AND RESOURCE DEVELOPMENT

Joseph R. Vadus, Chair
Global Ocean Inc.
Phone: (301) 299-5477
Email: jvadus@erols.com

ADVANCED SHIP TECHNOLOGY

Daniel Bagnell, Chair
Band, Lavis & Associates
Phone: (301) 261-1030, (410) 544-2800
Email: dan.bagnell@cdicorp.com

ENVIRONMENTAL SCIENCE AND ENGINEERING

Craig Alig, Chair
Carderock Div., Naval Surface Warfare Center
Phone: (301) 227-4402
Email: aligcs@nswccd.navy.mil

OFFSHORE STRUCTURES AND SYSTEMS

Robert Taylor, Chair
Navy Facilities Engineering Support Center
Phone: (805) 982-5419
Email: taylorrj@nfesc.navy.mil

Once again, to obtain the itinerary, study tour, and author instructions for the 24th UJNR MFP Meeting, go to:

www.dt.navy.mil/ip/mfp

For other questions, contact Geraldine Yarnall at (301) 227-1439 or email: Yarnallgr@nswccd.navy.mil

Mark Your Calendar for the Next UJNR MFP Meeting in Hawaii, 4–12 November 2001

Advance Plans for 24th MFP/UJNR Meeting in Hawaii

Preliminary Itinerary:

Nov 3 Nov 4	Saturday & Sunday	**Arrive**	
Nov 4	Sunday	Evening	**Informal UJNR members coordination meeting**
Nov 5	Monday		**Study Tours**
		AM	**Pacific Marine & Lockheed Martin** – see advanced ship designs; i.e. SLICE, NAVATEK & MIDFOIL [Possibility of a ride on the ship, (SLICE)]
		PM	(Tentative) Ships visits for Ocean 2001 conference.
Nov 6	Tuesday	AM	**Attend Oceans 2001 Opening sessions, and**
		PM	**Conference exhibits**
Nov 7	Wednesday		**UJNR Plenary** (same location but separate from Oceans 2001)
	Wednesday	Evening	**Luau dinner** (Included the Oceans 2001 Registration fee)
Nov 8	Thursday		**UJNR Plenary** (same location but separate room from Oceans 2001)
Nov 9	Friday		**Study Tours**
		AM	**Makai Ocean Engineering, Inc.** – cable laying experts. They have the world lead (90%) of the market on cable laying models and computer programs. Designs for air conditioning of buildings using cold deep ocean water.
			Hawaii Undersea Research Lab – Uses submersibles for scientific missions and studies of subsea volcano geodynamics.
		PM	**University of Hawaii** – Robotics Lab.; CO_2 Disposal and Methane Hydrates Research; the Marine Biotechnology Center and SAUVIM (semi-autonomous underwater vehicle)
	Friday	Evening	**UJNR Special Recognition Awards and Reception**
Nov 10	Saturday		**UJNR Executive Planning Meeting**
		PM	Fly to Kona
	Saturday	Evening	**Mauna Kea Observatory** – Sunset at 13,796 feet, the most scenic spectacle in the islands. Use the telescope to observe the treasures of the night sky. Learn the night sky from Polaris to the Southern Cross.
Nov 11	Sunday		**Kilauea** – the world's most active volcano, offers scientists insights on the birth of the Hawaiian Islands. View the volcanic landscapes.
Nov 12	Monday		**Study Tour: Natural Energy Lab Hawaii Authority & Common Heritage Foundation** – Companies are operating there to develop products using deep ocean cold water from pipes drawing water from depths down to 1000 meters.
Nov 13	Tuesday	**Depart**	

For updates and all details of the 24th MFP/UJNR Meeting, consult the Marine Facilities Panel web site:

www.dt.navy.mil/ip/mfp

IEEE EDUCATIONAL ACTIVITIES

WebEd Workshop

On 21-22 April in Alexandria, VA USA, Joe Czika, from the Ocean Engineering Society, and nearly 20 other participating Societies' and Councils' representatives began education collaborations for the new century. The 2001 Technical Society WebEd Workshop sponsored by the IEEE Educational Activities Board (EAB), and the Society Education Committee (SEC), and supported by the IEEE Foundation, provided this opportunity. Society representatives gave 5-minute overviews of their education plans, joined in breakout groups, and learned a new application, Hotfoot, which will facilitate the making and distributing of audio-PowerPoint tutorials.

Breakout groups were formed to help societies plan future activities that will facilitate lifelong education for all IEEE members. The groups also discussed resource allocation among Societies' education involvement, and the need for appropriate business models. Each breakout group concluded independently that the Societies need help from EAB to establish guidelines, standards, vision, and a plan for educational delivery.

Representatives left the workshop pledging to contribute a short tutorial to IEEE Professional Development Institute (PDI), using their complimentary copy of Hotfoot. SEC Chair, Dr. Saifur Rahman, announced a contest for the best three technical field overview tutorials. The tutorials must be submitted by 15 September.

Information on WebEd, including the presentations given by staff, volunteers, society representatives, and contest criteria can be found at www.ieee.org/eab/webed2/.

NOMINATIONS for IEEE/ABET EVALUATORS NOW OPEN

PISCATAWAY, NJ, 20 June 2001. Contribute to the engineering professional and public good. The IEEE Educational Activities Board seeks engineering professionals from industry, government, and academe to serve as program evaluators for accrediting engineering and engineering technology programs at U.S. universities. Nominations will be accepted through 31 October 2001.

The Accreditation Board for Engineering and Technology, Inc (ABET) provides a peer review of university programs that is vital to the continuing quality of the engineering and engineering technology professions. Aside from supporting the health of the profession, there are more tangible rewards for evaluators and their employers. The evaluators are trained in the Quality Process and are able to hone their decision-making skills. By virtue of being on campus, evaluators come in contact with the next wave of future innovators and industry leaders.

"The training helps to keep you up to date with all the changes being made every year in the criteria," said William Boley, Litton Guidance & Control Systems. "The campus visits are a great opportunity, to see first hand, the different approaches being taken in engineering education."

The IEEE members selected will attend a one-day training seminar on the IEEE/ABET accreditation process. After training, these program evaluators are dispatched in teams, one evaluator to a program, to visit engineering and engineering technology departments across the country on behalf of the IEEE and ABET. Evaluation sessions take place each fall and generally run for two to three days.

Read comments from a first-time evaluator. Information packages, including the application and nomination forms, are available on the web for engineering and engineering technology programs. For more program information, contact <eab-accred@ieee.org>.

Lynn Murison
Outreach Administrator, IEEE Educational Activities
ph: 1.732.562.6526
www.ieee.org/organizations/eab/

World Records, New Technologies at the Sixth International Submarine Races, Carderock, Maryland

Sponsored In Part By The IEEE Oceanic Engineering Society.

New world speed records and innovations in propulsion systems were highlights of the successful running of the 6th International Submarine Races, an engineering design competition held at the U.S. Navy's David Taylor Model Basin. The ISR is one of the world's most unusual human-powered vehicle races in which custom-designed, wet (flooded) submarines, powered by crews wearing scuba gear, compete against the clock on an underwater, 100-meter course.

Omer 4, a sleek, dolphin-like, one-person submarine from the University of Quebec, Ecole de Technologie Superieure, Montreal, established a world speed record of 7.192 knots (more than 8.2 miles per hour) on the final day of racing, beating its previous record set the day before and besting the existing world record of 6.997 knots established in 1997 by Omer 3. A surprisingly second-fastest showing — particularly against major university competition — was turned in by an independent sub, Scuba-Doo, designed, built, and crewed by a recent high school graduate from Wheaton, Maryland, and a Navy civilian engineer. The sub achieved 5.088 knots. Virginia Polytechnic University's sleek Phantom 3 sub, using a prop borrowed from Scuba-Doo, posted a speed of 5.017 knots to third place in the one-person, propeller-driven division. The single-person subs

were a clear trend in new vehicle design, with reduced weight obviously increasing performance. Speeds have steadily increased since the first race in 1989.

In the closing ceremonies, the $1,000 award for overall performance, sponsored by the IEEE Oceanic Engineering Society, went to Virginia Polytechnic University, Blacksburg, Virginia. Judging was for speed and maneuverability in the water as well as high-tech design of composite materials, computerized advanced power-to-propulsion conversion, and the team's response to challenging and changing circumstances during race week.

In other awards: Absolute Speed, Omer 4; Best Use of Composites, Omer 4; Innovation, 1st place Reef Cruiser, Robert Golobic, 2nd place Jonah, Merchant Marine Academy, 3rd place Neptune, University of Michigan; Spirit of the Races, Merchant Marine Academy and Lawrence Technical University, a tie. Best Design Guideline, Lawrence Technical University.

In one of the most unusual team efforts, the U.S. Merchant Marine Academy fielded a submarine named Jonah, looking pretty much like the skeletal remains of a big bluefin tuna. Made of scavenged pieces of scrap aluminum that formed ribs, attached to the spine with screws and duct tape, Jonah is an open sub without a hull. It completed the course, taking nearly 30 minutes to do so, at less than a knot and to the cheers of all the other submariners. This sub, not only designed to look like a fish, also acted like one; it waved its large plastic tail for power as it swam down the 100-meter course.

Under official U.S. Navy sponsorship, racing went on Monday through Friday at the Naval Surface Warfare Center's Carderock test tank, a 3,200-foot-long building housing a huge tank for testing ships and hulls. Major sponsors, in addition to the Navy, are Electric Boat, Lockheed-Martin, and Global Marine and Global Crossing. Other sponsors include IEEE, Newport News Shipbuilding, Nauticos Corp., T.A.H. Industries, Oceaneering International Inc., Systems Planning & Analysis, Anteon Corporation, The Naval Submarine League, and Compass Publications Inc.

This was the third time the event was held at David Taylor. "We were very pleased to be able to host once again such an outstanding educational and engineering endeavor," said Capt. Steven Petri, division commander at Carderock. "Because of the Navy Reserve divers assigned to assist, and the help provided by Carderock personnel, this has been our smoothest and most successful race ever held," added ISR race director Jerry Rovner. "We have almost doubled the number of individual runs by sub teams compared to previous races." Rovner especially praised the ISR all-volunteer team of timers, safety specialists, computer experts, and many others who made the race such a success. Nancy Hussey, executive director of the ISR, said, "These submarine races have demonstrated once again the value of providing the opportunity for bright and creative students to apply what they have learned. We continue to be delighted by the ingenuity of these outstanding contestants. We are especially grateful to the Navy and to our corporate and foundation sponsors for making possible this rewarding event. The ISR tries to provide an education in reality for marine technology and ocean engineering students by encouraging them to design, build, and race their own human-powered submarines. We look forward to continuing this tradition.

More at http://www.isrsubrace.org.

Who's Who in the OES

Stephen M. Holt

Stephen Holt received his B.S. in Mathematical Physics from Wilmington College (Wilmington, Ohio) in 1973; his B.S. in Electronic Engineering from Franklin University (Columbus, Ohio) in 1974; his M.S. in Engineering (with specialization in Ocean Engineering and Underwater Acoustics) from The Catholic University of America (Washington, DC) in 1978, and his Graduate Certificate in Engineering Management from The Catholic University of America in 1986.

Steve has been currently employed since 1984 with both the Mitre and Mitretek Corporations of McLean, Virginia as a Lead Systems Engineer with the Oceanic, Atmospheric and Space Systems Division. He primarily supports the National Oceanic and Atmospheric Administration (NOAA) through the National Weather Service (NWS). He has been involved since 1984 in several meteorological and oceanic programs, the longest of which is the continued technical development of the WSR-88D Doppler Weather Surveillance Radar. This radar has both land based and marine applications. Before Mitre and Mitretek Systems, Steve was employed with TRW Inc., EG & G Corporation, and Westinghouse Electric Corporation. As a Technical Sergeant (E-5) in the US Army (1968-1972), he was responsible for maintenance and deployment of the Nike-Hercules Missile System

Steve has been a Session Chair or Speaker in the last three Marine Technology Society conferences. His main interests are in radar and sonar systems engineering. Steve is married to Dorothy and they have a daughter, Shelly. His hobbies include serious amateur astronomy and paleontology, reading historical works and listening to classical music.

Paper Presented at Oceans 2000 Conference

Massachusetts Ocean Technology Network: A Model for Marine Technology Business Cooperation, Development and Growth

Maggie Linskey Merrill, Massachusetts Ocean Technology Network Director

Abstract

New England is home to many world-class research institutions, universities, government agencies and commercial businesses that work in the marine technology, development, and production field. These entities often cooperate when there is a need for several products to be integrated into a system. They also have been known to compete for government contracts to design and build one-off types of instruments to measure some aspect of the ocean, weather, or benthic environment. It is estimated that in Massachusetts alone the marine technology revenues generated via commercial sales are upwards of $300 million annually. That figure does not include the influx of funding for government, university, or institutional research. There are an estimated 3,000 employees working directly in the commercial sector of the marine technology business in Massachusetts. Business is strong in deep water oil and gas exploration, port and harbor dredging, and cable and pipeline laying, to name a few. With business so good, why would a relatively small group of otherwise fierce competitors want to join forces under the umbrella of MOTN? The answer is that after five years of working diligently to address the business development needs of industry, MOTN has demonstrated that there is strength in numbers. An organization that was founded in 1994 with funds from the state of Massachusetts, MOTN has grown from a nucleus of 25 members to an expanding group of 49 corporate and institutional members. Lead by a dedicated group of officers and directors, with frequent input by members, MOTN provides a variety of services that help members stay tuned to changes in the business environment, take advantage of government programs aimed at assisting small and medium sized companies, and promote the members at numerous marketing venues all over the world.

The presentation will discuss the background of the formation of MOTN, review MOTN's activities over the past two years and discuss how it has improved the business environment for the members and how other regions with a concentration of marine technology companies and organizations can benefit from forming a similar organization.

Introduction

In 1994 during the military cut back period funds were flowing to assist private industry with defense conversion. It was during this time that Massachusetts Ocean Technology Network was formed. Some called it the dreaded peace dividend. When the cold war ended so did the seemingly limitless military spending on anti-submarine warfare technologies, weapons improvements, and yes, those one million dollar toilets. This situation caused every one in the marine technology community to shift their focus to different markets. That process of changing markets was very costly and time consuming. New and different resources were needed to make informed decisions about which markets to enter. The many small companies that characterize the marine technology business benefited greatly through belonging to an association that enabled them to collaborate on projects that they could not afford to do alone. Six years later, the members of the group are much better positioned to survive the mood swings of government funding.

MOTN is a 501 c (6) non-profit organization, which operates as a trade association with the express purpose of promoting, supporting, and expanding the marine technology manufacturing and service business throughout New England. Operating funds come from Massachusetts Office of Economic Development's Manufacturing Extension Partnership Program, from members' fees, and from income generated from MOTN functions, workshops, and special projects.

Profile of MOTN Membership

MOTN is comprised of marine technology manufacturing firms, research institutions and service firms that design, build and service oceanographic equipment for measuring and monitoring the oceans worldwide. Some of the instruments and services they provide include: underwater positioning and tracking systems; hard copy data plotters, current, conductivity, temperature, depth recording instruments; remotely operated underwater vehicles, electronic chart data bases, research vessels for hire, marine environmental consulting, machining services, research insupport of commercial development, equipment leasing, acoustic positioning devices; side scan, sub-bottom, multi-beam and chirp sonars; flotation and mooring systems; various weather and monitoring buoys; international marketing and technical writing services; advanced transducer technology, and vessel tracking systems.

(Refer to Appendix 1, MA Ocean Technology Network Members)

The members are global players with more than 50% of their products being exported. Every day they face foreign competitors, whose governments are subsidizing the development, manufacture and international sale of competing products. Their products and services are utilized to provide data and analysis for a variety of applications which are listed below:

- Fisheries management and marine habitat studies
- Environmental monitoring of coastal areas
- Remediation of hazardous waste and toxic chemical spillage
- Weather monitoring and global warming predictions
- Seabed mapping and bottom sediment classification

- Ocean survey to support the installation and maintenance of trans-oceanic telecommunication cables and port and harbor dredging
- Military sonar for naval surface ship and submarine applications
- Sub-bottom profiling in search of offshore oil and gas and in support of offshore operations
- Use of robotic and autonomous underwater technology for sub sea search, salvage and monitoring.

Organization

The group set about creating an agenda to identify activities that were of mutual benefit for its (then 25 membership). Now with 49 members and growing, the MOTN has demonstrated its value to all concerned. It began as a Massachusetts-only group and quickly expanded to New England based. Members are included from Connecticut, Rhode Island, Massachusetts, New Hampshire, Maine, and Vermont. All members are full voting members. They pay an annual membership fee and are charged separately when they participate in specific activities. They are expected to attend at least one full membership meeting each year where the officers and directors are elected and contribute time in committee efforts.

The spark that ignited the fuse which lead to MOTN's formation was a $3,000.00 seed grant to co-sponsor a newsletter, the ***Marine Technology Reporter (MTR)***. ***MTR*** is a quarterly newsletter that reports on marine, environmental, and engineering news focused on New England. Based on the success of that newsletter the original funding agency, Bay State Skills Corporation, included the marine technology sector in its "Request for Proposals" to small manufacturing based industries in the state. When MOTN's director found out about the funds, she addressed a group of marine technology manufacturers to see if there was any interest in going after them, she said, "if the textile, plastic, jewelry, environmental services, and food service industries in Massachusetts can get these funds, the marine technology industry will surely qualify." The core group of founders went after the funds with a vengeance and MOTN continues to grow and prosper six years later.

Since that time deep sea offshore oil exploration, and production, to a lesser degree, have fueled an upswing in business activity. The meteoric growth in the mid-nineties and even the slow down in the SE Asia market for port and harbor opening, dredging, environmental monitoring for resorts and infrastructure development have also fueled a healthy recovery for the ocean technology businesses. These two "diversified" markets have enabled companies that sold a majority of their products to the US military to continue to grow and thrive.

MOTN's strength-in-numbers approach to marketing and their extremely successful international marketing program have increased the profile of the members. They are recognized as world leaders in ocean technology design, development, and manufacturing.

For the past two years MOTN has been addressing many of the joint promotion and business improvement needs of the membership. The series of programs the network is currently undertaking fall into two general categories, which are outlined here.

Business Cooperation

MOTN has demonstrated value to the membership through a variety of joint promotion activities. Going to key ocean related trade shows together has been one of MOTN's trademarks that attracts and keeps members engaged. There are other joint projects listed here and ones that are in the concept phase. A key MOTN objective is to undertake projects that show mutual benefits to the members quickly.

- **September 11-14, 2000 Oceans MTS/IEEE, Providence, RI:** Twenty - thirty MOTN members will exhibit at this major US ocean technology trade show and conference which attracts 2000 individuals from industry, academia, and government. Most of the members will exhibit in a designated area. While each member has its own identity, the fact that they are exhibiting together makes it easy for customers and other interested parties to see what the group has to offer. MOTN has become famous for their friendly and welcoming receptions, which are held during the trade shows. These receptions enable the MOTN members to invite customers or potential customers to a much larger, more impressive event then they could hold themselves.
- **April 3 – 5, 2001, Oceanology Americas, Miami, Florida:** MOTN companies will be exhibiting together at this first-ever Oceanology to be held in the US. Again, the MOTN group is planning special promotions and a reception at this event.
- **Ocean Technology Workshop 2001:** The Ocean Technology Workshop will be held in Plymouth, MA in September, 2001. This will be the third such event the MOTN has hosted. It is a two and a half day workshop where product engineers train users of equipment, potential users, and sales representatives on new products. All MOTN companies are offered an opportunity to provide at least one day of training on their product(s). The last two events have been extremely well attended by key customers, potential customers, and sales representatives. The member companies and organizations support the OTW because it gives them a unique opportunity to bring customers to their own backyard to see products, meet key personnel, and in many cases visit their facilities. This workshop attracts serious buyers and users who want to meet the design engineers and see how an instrument works. Daily at-sea equipment demonstrations are also included and they are very popular.
- **Ocean Technology Career Day:** MOTN has run two career days in cooperation with the University of Massachusetts Center for Marine Science and Technology and will continue to collaborate with area universities and the Marine Technology Society of New England to run Ocean Technology Career Days whenever needed. The next one will take place at Oceans 2000 in Providence in partnership with the University of Rhode Island. Marine related companies from all over the country are invited to set up table–top displays, and promote their available positions via a job fair web site. Students and mid-career professionals from all over New England are invited to attend. Both

companies and job seekers have found these to be a very effective way to speak to employees with a marine science and or engineering focus. Many of the students who attended the previous job fairs had no idea there were so many marine related firms located in Southern New England. The company people were very impressed with the caliber and training of the students.

- **2000 - 2001 Membership Directory and Web Page Updating:** Printing the MOTN membership directory and replicating it online is MOTN's prime joint promotional tool. All members are listed with hot links to their own web pages. The booklets are distributed at trade shows, at members' facilities, and at various technical and governmental gatherings in the region. MOTN activities and upcoming events are included as are news releases of the members. The web page is being upgraded to include: a job-employee search capability, more links to related sites, and more company news.
- **Linking with Area Educational Institutions:** New England is rich with world-class research and teaching institutions which constantly feed ideas, personnel, and sometimes contracts to the private sector members. As a service to members, MOTN has developed a list of all the schools in Massachusetts that have programs, researchers, and technologies to offer the marine technology industry. Several of the institutions are active members in MOTN.

Business Development Projects

The projects listed here are examples of the type of activities MOTN undertakes to create more business and exposure for the members. The marine technology design, manufacturing and service sector do not fit into neat business categories, yet the technology they create is unique, is manufactured in relatively low volume and is very high in value.

- **Economic Study of the Marine Technology Sector:** There is a need to define the economic impact of the marine technology sector in Massachusetts and identify future markets for our member's products. This information updated annually or semi-annually would be very helpful to the financial community for investment purposes, to the banking community for loan assurances to economic development groups, and to MOTN members for planning purposes.
- **Guide to Ocean Instrumentation Applications:** An edited collection of papers authored by experts addressing the best way to use some of the products designed and manufactured by MOTN members is being planned.
- **Business Improvement Seminars:** In conjunction with Massachusetts Manufacturing Extension Partnership, MOTN offers a series of seminars during the year on CE Marking, ISO-9000, Fast Track Manufacturing, Technology Transfer, E-commerce and more. These seminars help the businesses take advantage of the latest in manufacturing improvement information. They give the members an opportunity to get together and network amongst themselves to share ideas and solutions to common problems.
- **MOTN Trade Mission:** During the spring of 1999, MOTN organized a highly successful marine technology trade mission to two cities in China and to Singapore. This trade mission was designed by MOTN members with implementation assistance from Massachusetts Trade Office, Massachusetts Port Authority, and the US Foreign Commercial Service in Shanghai. All day seminars and site visits were arranged in both Qingdoa and Shanghai. After the China visits, the group traveled together to attend an oceanographic trade show in Singapore. Another trade mission is being planned either to Vietnam or South America in the coming months.
- **Legislative Affairs:** It is clear that government economic assistance programs are being directed to groups of companies that have matching funds and that are organized. During the course of MOTN's brief existence, keeping state and federal legislators abreast of the size of the industry, its impact on the economy, and government funding programs of interest has been a challenge. MOTN formed a committee to represent the marine technology business interests at various state and academic forums. Their efforts have been more reactionary rather than pre-emptive. During the coming months the committee will develop a list of industry concerns. They will then bring these to the attention of both state and federal officials for their comment and direction.

Key Elements of Forming a Network

To form a network or business cluster, it is best to take advantage of regions where many marine technology firms, research institutions, and government offices already exist. Identify the key players in those organizations and form an alliance of some sort. Most networks apply for non-profit status with the internal revenue service. Once there is a group of committed individuals and a person who will manage the process, pursue funding from a core group or outside source.

Continued governance and management of the group is crucial. MOTN has a board of directors, officers, and committee chairs who meet periodically to direct the efforts of the part-time manager. A core group and executive committee can accomplish the bulk of the day-day issues in regular e-mail communications. In fact the entire membership is on an e-mail list server. The MOTN manager can send out memos, notices of meetings, surveys, and messages to the entire membership in the click of a mouse. Utilizing e-mail and the power of the Internet is extremely efficient and cost effective. Just five years ago, members were receiving expensive and mailings. Now that is saved for items that absolutely must be mailed. The fax machine isn't even used as much as it was two years ago. Most communications are via e-mail. It enables frequent contact, fast response, and often negates the reason for a physical meeting. That is good, because people in this business don't have a lot of extra time.

Funding a start-up network or business association can come from the core membership and public or private sources. MOTN received seed grants of $3,000 and $10,000 during the first two years. These funds were used to hire a part-time administrator, form a non-profit corporation, publish a membership directory, create a web page, and set goals and sources for future collaborative projects that would benefit the membership. There were many organizational meetings, social events, and presentations made to all within the marine community

and outside the marine community to raise awareness about this unique sector of the overall marine economy.

Don't think a network can become successful overnight. Bringing MOTN to this point has taken six years, a strong commitment from members, strong management, and $40,000-$70,000 in outside funds per year in the last four years.

Through strong feedback to the funding organizations about how effective the activities were, MOTN was able to secure a series of substantial matching funds grants. These funds have enabled MOTN to grow and prosper. The matching funds model has enabled MOTN to double and in some cases triple the impact of the state funds. The last three years of state budget battles and subsequent funding holdbacks, delays, and threats of termination have convinced the MOTN to actively seek alternative sources of income. It is also clear the activities of the group cannot be financed solely through membership fees. Consequently, MOTN is now identifying projects that will generate revenue to cover operating costs. Examples of those projects, described earlier include: the Ocean Technology Workshop, the Economic Analysis of the Marine Technology Sector, and the Guide to Ocean Instrumentation Applications. It is hoped that these three items will increase MOTN members exposure, attract additional members, and generate some income via sales or via providing key information to new funding groups about the existence, size and potential of the members.

Conclusion

There is definitely a need for a trade association for the marine technology industry. There are similar organizations, but none have the business focus that MOTN has. There is no organization representing the business interests of the equipment designers and manufacturers. Forming a trade association is enabling small firms to compete in the world market. Legislators and financial organizations now have somewhere to go to learn about the industry, obtain data about the business and analyze it for investment purposes.

The marine technology business is emerging. The products produced are typically high technology, low volume and high price. The price for components and parts are coming down based on new and improved rugged low power technologies. These savings are already being passed on to the customer. The future will undoubtedly bring increased need for information about the planet we live on. There is a constant need to monitor the coast, water column, and sea surface interface for commercial, industrial, military and scientific purposes. The members of an organization such as MOTN are well positioned to take advantage of all sorts of new economic development initiatives and new business opportunities including forming partnerships with academic and government groups to develop and commercialize research tools.

Biography

Prior to establishing herself as Marine Marketing Services, principal, Maggie Merrill held positions as marketing coordinator at Sea Data Instruments, assistant manager of the MIT Sea Grant Marine Industry Collegium and as a research assistant in the Marine Policy Program at WHOI.

She has a BA from Boston College in English and Environmental Studies and she participated in Sea Semester, a college semester at Sea Education Association in Woods Hole, MA. Maggie Linskey Merrill served on the SEA board of trustees and as a member of the corporation from 1980-1995. She is past chairman, vice chairman, publicity officer of NE Marine Technology Society, she currently is a member of the MOTN and volunteers at Derby Academy, Old Ship Church, the Hingham Harbor Development Committee and on the Worldís End Management Planning Team for the Trustees of Reservations all located in Hingham, MA.

Ms. Merrill has written numerous papers relating to the work described above. Contact her directly for a list of publications: 3 Otis Street, Hingham, MA 02043 781-740-1456 email: martrep@aol.com.

Minutes to the IEEE Oceanic Engineering (OES) AdCom Meeting, Houston, Texas, 28 and 29 April 2001

Although a meeting was held on Saturday afternoon 28 April, by the members of the Conference Coordination and Policy (COCOPO) group, (the results of which will be addressed later in this report) the main AdCom meeting began on Sunday morning, April 29. The attendees were:

Dr. Tom Wiener (President)
Ms. Pam Hurst
Dr. Stan Chamberlain
Mr. Fred Maltz
Mr. Bob Bannon
Dr. Rene Garello
Dr. John Czika
Mr. Jim Barbera
Ms. Sherri Rees
Dr. Dan Alspatch
Mr. John Irza
Mr. Steve Holt (Secretary)
Col. Norm Miller
Mr. Claude Brancart

The formal agenda to be addressed was earlier forwarded to each of the attendees by Tom Wiener and is included as Attachment A.

The AdCom meeting began at approximately 8:30 AM. Some of the salient points made during and after this meeting were:

Tom Wiener asked for each person to identify themselves and say a few words about their personal and professional interests.

Tom started by then giving a presentation entitled IEEE Oceanic Engineering Society Action Plan for 2001. This presentation is included as Attachment B. Also included in in this attachment is a reprint of an excellent article that he wrote for the Spring 2001 IEEE OES Newsletter which addressed several issues that he brought up during his presentation.

Tom's presentation addressed the following issues: (1) financial impact of the IEEE budget, (2) improving relations with the MTS, (3) dealing with the Oceanography International (OI) America Conference, (4) planning for multiple conferences each year, (5) improving the management of conferences, and (6) continuing the migration towards electronic publishing.

Tom stated that he would like to energize the AdCom Committee, and this is summarized in a series of four actions contained in the attachment. Several other important issues were: conference management, conference extension, membership, chapters, the Journal of Oceanic Engineering, and the OES Newsletter. Expected achievements for this year are given in the final section of this attachment.

Steve Holt took a personal action item to send out the latest AdCom Roster to all members electronically by 25 May 2001. This list is included as Attachment C.

There was a discussion on how many classified papers in the past are now being declassified (like those from Project Artemis) and will be available to the public.

There was a discussion on what funds are available for the IEEE OES and how the OES would not exist without funding from the Oceans Technology Conferences (OTC).

Jim Barbera next gave a presentation entitled "Treasurer's Report" which summarized the OES's budget. This report is included as Attachment D. As a result of Jim's presentation, four action items were generated. They were: (a) Jim will check with the JOE Editor (Jim Lynch; Bill Carey, Acting) to determine the page count for the Journal of Oceanic Engineering (JOE) this year for budgetary purposes, (b) Jim will contact IEEE Headquarters to determine mechanics to initiate a Life Membership option for the OES, (c) Jim will notify all Conference Chairmen (through the OES Liaison) that the IEEE must review all contracts (the IEEE rules require this review process for all amounts exceeding $25,000. For the "Oceans" conferences, this is encouraged but not required) and (d) Jim will determine IEEE policy re tax exempt status re hotel rooms for OES conferences/meetings.

There was a discussion on the possibility of forming a "New Opportunities" Committee to be chaired by Pam Hurst to accomplish the proposed list from Tom Wiener's "Other Opportunities" presentation made earlier in the day. This committee would hold a Strategic Planning meeting to brainstorm many issues and actions Tom spoke of. The session would review common actions and review linkages between similar topics/actions. The outcome would be an OES roadmap of activities/actions, master action item tables, master milestone schedules, organization charts, committee leads, and prioritization of actions. This should be reviewed with Tom by August to set realistic goals for pre-planning activities to initiate action for the year 2002 results. Establish leadership roles, budget, meeting dates, places, and schedules. This issue of establishing an IEEE OES AdCom "New Opportunities" Committee became an action item.

There was a discussion on the distribution policies related to the OES Newsletter. Was it important to continue to utilize new technologies and tools to distribute the Newsletter, or should we keep the mainstay Newsletter in paper form for the benefit of those without the latest available technology for the sake of maintaining our audience? This issue became an action item.

There was a discussion on the progress to have a comprehensive database developed for a large number of past articles from the IEEE OES and IEEE/MTS conferences as well as past IEEE Journal of Oceanic Engineering articles. This is part of the IEEE OES Digital Library effort that Dr. Glen Williams has been involved with. His list so far includes 9250 articles over the years 1970-2000, and the main issue is whether these articles should be placed on CD-ROMs or DVDs and utilize De-Vu format technology. There was a proposal made for Glen to develop an update plan for the Digital Archive (Cost and Procedures) due by the next ExCom Meeting in July, 2001. This issue became an action item.

Steve Holt discussed the present condition of the IEEE OES web site. It has been agreed that the web site should be developed and maintained by a professional firm and not by any IEEE OES members. Bids will soon be extended to several different firms before a decision is made. Dr. Todd Morrison, the Publicity Committee Chairman, is leading this effort. At the time of this meeting, the web site was being updated with current information supplied by Steve Holt to the Web Master (Eric Nelson). An Action Item still exists related to this effort, but this new one was generated based on this issueís criticality.

Steve Holt gave a presentation for Joe Vadus on his conference work. His full Conference Report is included as Attachment E. His report is actually a collection of reports by John Wiltshire and Liz Corbin (Oceans 2001), Rebecca Smith (Oceans 2002), Robert Wernli (Oceans 2003), Prof. Tamaki Ura (Oceans 2004). Joe has also written a report entitled "A Summary of Oceanology International (OI) Americas 2001" in which he reports on this conference but also shares with us some of his personal views. Include also in this attachment are brochures advertising several upcoming conferences.

Joe also wanted to relay three important issues. The first was to "consider having two or three ExCom meetings per year with one of them occurring a month before the annual Oceans" conference ala Providence (Oceans 2000). Second, "hold one AdCom meeting at the annual conference. (Hold one or two others mainly to review OES AdCom assignments)". Third, "the purpose of this proposal is to avoid 17 OES related meetings such as were scheduled at Oceans 2000 in Providence. (P.S. Perhaps two or three people can assess this proposal or substitute)".

Norm Miller gave his report on his Chapter activities. The highpoints of his discussion were:

He discussed several topics, including (a) membership, (b) member satisfaction, and (c) Chapter development.

At the present time he stated that we have eight active chapters which consist of three in the United States, two in Canada, and one

each in France, Norway, and Japan. Norm then discussed the status of their sub-chapters and, in general, the ups and downs of each.

He then gave an accounting on his work with the student chapters. He detailed the advantages of forming student chapters in the universities along with several frustrations in making this happen. There is hope that new chapters can be formed through the University of Rhode Island and Florida Atlantic University. Norm encourages each Chapter to come up with ideas so that we can help fund them ($500 for now).

Norm also spoke about the need to upgrade our memberships, especially for Members to upgrade to Senior Member status. He also stated that the OES is the smallest of the societies in the IEEE. While the IEEE had in general a great year in 2000, our society has lost members. During the past several years we have had several membership promotions at our conferences and have encouraged non-members to join the OES. There has been a tendency for many, however, to drop out after one year. Norm said that we have asked the members to give us feedback on what they liked and disliked about the Society.

An excellent article written by Norm for the Spring 2001 edition of the IEEE is included as Attachment F.

Claude Brancart recommended that we update the OES Membership List. This issue resulted in an action item being generated In Abstention to Jim Collins to provide this.

Tom discussed the need for all AdCom members to bring in at least one new member this year. Also, all AdCom members should attempt to raise their Member status to Senior Member status as soon as possible. Information on this process is on the IEEE web site at: http://www.ieee.org/ membership/upgrade.html. An action item resulted from this suggestion.

There was a motion to approve all the formal minutes to the previous ExCom meeting in Albuquerque, NM in February 2001 and the last AdCom meeting in Providence, RI last September 2000. This motion was approved.

Although Jim Collins could not attend this meeting, a proposal of his was tabled which suggested that the IEEE OES implement a permanent membership dues option with a one-time payment of $40. This motion was approved.

Tom Wiener proposed that the annual membership (periodical rate for JOE) fees for IEEE member or student member stay the same at $12 annually. This motion was approved.

There was a motion to change the non-member annual subscription price for the JOE from $175 to $195. The motion was approved.

There was a motion to increase the Editorial Reimbursement section of the budget from $16,900 to $31,900 by adding $15,000 (line item 01900-45150). The motion was approved.

There was a motion to lower the Reimbursable Service-S/C Book Broker income from $87,100 to $50,000 (line item 01900-60220). The motion was approved.

There was a motion to give $5,000 to Fred Maltz to purchase a new computer and color printer to perform his IEEE OES Newsletter duties. The motion was passed.

Tom Wiener made a motion to raise the amount of funds given to the Student Coordinating Committee (using the Student Paper Contest line item 01900-40895) from $2,600 to $10,000. The motion was approved.

There was a motion to add $18,000 to the Publicity and Public Relations section of the budget (line item 01900- 40878). The motion was passed.

There was a recommendation to have a review of Sprago Corporation by someone like a COTR on how they are doing their job. This matter will be investigated by the COCOPO group.

Dr. Rene Garello gave his report on the previous day's COCOPO meeting. This report is included in Attachment G and contains the minutes and several recommendations for future action.

There was a discussion on whether some Exhibitors do or do not want to participate in the Oceans' conferences. It was felt that many do not and that they prefer the OI Americas kind. Another discussion centered around whether we feel that the Oceans conferences could still be profitable without exhibitors there? There was also a proposal to form the guidelines on how to conduct a consumer survey for each conference "exhibitor" so as to assess the feasibility of someday having two ocean conferences each year. An action item resulted from this discussion.

There was a proposal to have a "Best Paper of the Year" Award. It would be placed under the umbrella of the Technical Committee. It would be for a minimum of $1000 and it would be awarded at the annual Oceans Conference for the previous year. The motion was approved.

Stan has delivered his "2000 Report on IEEE/OES Technology Committees - Final" version and has allowed it to be included in this report. The final version contains information from the OES Technical Committee Chairs meeting in Providence, RI (for Oceans 2001) that occurred after the AdCom meeting. This report is included as Attachment H.

2.0 IEEE OES AdCom Meeting Conclusion:

It was decided that twelve Action Items and ten Approved Motions were generated from this meeting. All of these issues plus the past action items that were generated at the ExCom meeting in Albuquerque, NM in late February 2001 and at the ExCom/AdCom meeting at Oceans 2000 in Providence, RI in September 2001 are contained in Attachment I. They are now each assigned a database-like number to facilitate their tracking.

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Upcoming Conferences and Meetings

Waves 2001,
The Fourth International Symposium on Ocean Wave Measurement and Analysis
September 3-5, 2001
San Francisco, CA
http://edge.tamu.edu/waves01

3rd Ocean Technology Workshop
September 17-19, 2001
Plymouth, MA
http://www.MOTN.ORG

Dynamic Positioning Conference
September 18-19, 2001
Houston, Texas
http://www.dynamic-positioning.com

Undersea Defense Technology (UDT)
Conference & Exhibition
October 30-November 1, 2001
Hawaii, Texas
http://udt-net.com

UJNR Marine Facilities Panel
November 4-12, 2001
Honolulu, Hawaii
http://www.dt.navy.mil/ip/mfp

MTS/IEEE Oceans 2001
November 5-8 2001
Honolulu, Hawaii
http://www.mtsociety. org

OTC 2002: Deep Into the Future
Offshore Technology Conference
May 6-9, 2002
Houston, Texas
http://otcnet.org

Underwater Technology 2002 International Symposium
April 16-19, 2002
Tokyo, Japan
http://underwater.iis.u-tokyo.ac.jp/ut02/

Oceans '02 MTS/IEEE
October 29-31, 2002
Mississippi Coast Coliseum and Convention Center
http://www.mtsgulfcoast.org

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