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NEWSLETTER



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EDITOR: HAROLD A. SABBAGH

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**CONFERENCE AND EXPOSITION
THE OCEAN – AN INTERNATIONAL WORKPLACE
SEPTEMBER 28 – OCTOBER 1, 1987**

World Trade and Convention Centre, Halifax, Nova Scotia, Canada

Co-Sponsors :



The Marine Technology Society



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and Electronics Engineers
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Mr. Joseph H. Seiler,
Seimac Ltd.

Assistance From :

**The Department of Fisheries
and Oceans, Canada**

**The Society for Underwater
Technology (UK)**

Conference Address :

**Oceans '87, c/o Bedford Institute of Oceanography,
P.O. Box 1006, Dartmouth N.S. Canada B2Y 4A2
Phone : (902) 426-8778**

Tutorials

Oceans '87 will offer eleven tutorial sessions to provide participants with in-depth treatment of the latest in key aspects of ocean technology ...

T1 – Electro-Mechanical Cables

Tutorial Leader : Albert G. Berian, Chairman, Undersea Cable and Connector Committee, Marine Technology Society, Culpepper, Virginia, U.S.A.

Electro-mechanical cables are used in many aspects of ocean research. Knowledge of their construction, use and maintenance is therefore important to engineers and oceanographers. Topics covered : construction characteristics, working environment, parts of contra-helically armoured E-M cable, performance characteristics of C-H-A, manufacturing processes for E-M cables, handling E-M cables, field inspection and testing, retirement criteria, cable material, C-H-A cable specifications, available cable service.

T2 – Principles of Radio and Acoustic Positioning

Tutorial Leader : G. Andrew Power, McElhanney Services Ltd., Dartmouth, N.S., Canada.

Radio Navigation Definitions and Concepts - Definitions and concepts required to discuss radio positioning. Datums - Local and satellite datums and their relationships. Map Projections - Projections in use and reasons for their use. Electromagnetic Spectrum : Propagation of electromagnetic waves, Earth's surface properties, characteristics of radio systems and modes of operation. Microwave, Medium and Low Frequency Systems - Availability, modes of operation, expected range, accuracy and costs. Acoustic Navigation - In addition to the topics above, as they relate to acoustic systems, discussion of long and short baseline equipment, expected range, accuracy and costs.

T3 – Development and Use of Underwater Vehicles

Tutorial Leader : James R. McFarlane, International Submarine Engineering Ltd., Port Moody, B.C., Canada.

The iterative method for production of underwater vehicle designs, including equations used to determine specific characteristics. Current use, future developments and potential impact of artificial intelligence will be explored.

T4 – Ocean Weather Applications

Tutorial Leader : John Thompson, Ocean Routes Canada Inc., Bedford, N.S., Canada.

Weather places a severe restriction on activities at sea, but until recently has been a largely unquantifiable factor in decision making. This has changed, and the tutorial describes state-of-the-art application of meteorological sciences to marine operations. Data Sources - real-time forecasting and meteorological studies can require large amounts of data. Available types and sources are outlined. Technology - the latest technology is surveyed, including communications, remote sensing, unattended weather stations and computer programming & graphics. Forecasting As a Decision-Making Tool - employing modern communications and computer power, the effect of weather on ocean operations can be quantified and communicated in a timely and understandable manner to those making operational decisions. Application to ship routing and offshore operations is outlined.

T5 – Acoustic Signal Analysis for Marine Applications

Tutorial Leaders : Dr. Jean Morlet, O.R.I.C. (Elf-Aquitaine), Rueil-Malmaison, France, and Dr. Ferial El-Hawary, Modelling and Signal Analysis Research Laboratory, Technical University of Nova Scotia, Halifax, N.S., Canada.

Practical techniques in acoustic signal analysis, with special emphasis on wavelet transform. Practical application examples use video-clip material. Preprocessing requirement for marine seismic applications and models of heave dynamics are considered. Kalman and recursive filtering techniques for heave compensation are discussed, along with the use of modern parallel Kalman filter and systolic array for design of special-purpose computers.

T6 – Fibre Optics - Applications in the Marine Environment

Tutorial Leader : Dr. Barry Paton, Focal Marine Ltd., Bedford, N.S., Canada.

Technical overview of marine fibre optic systems, including components such as fibres, cables, connectors, splices, optical taps, multiplexers, transmitters and receivers. Analog and digital systems are analyzed, including general system design, flux and rise time budgets, performance trade-offs, system assembly and testing. A fibre optic ROV tether system is used as a design example. Several ocean fibre optic

sensors are examined. The tutorial is practical, with examples from submersibles, seismic cables, shipboard LAN, biological and oceanographic sensors.

T7 - Surface-Based Radar Detection and Classification of Sea Ice and Icebergs

Tutorial Leaders : Dr. Simon Haykin and Dr. B.W. Currie, Communications Research Laboratories, McMaster University, Hamilton, Ontario, Canada, and Dr. E.O Lewis, Department of Fisheries and Oceans, Burlington, Ontario, Canada.

Overview of Ice Sensing/Management Problems - the role of airborne/satellite/surface, history, summary of present capabilities. Ice Problems. Microwave Radar Theory and Practical Considerations. Effects of Radar Parameters - Experimental program, frequency polarization and resolution. Display Requirements and Issues. System Design - considerations, demonstration of new results, future directions.

T8 - Collection, Analysis and Use of Wind/Wave and Current Data

Tutorial Leader : Simon Skey, MacLaren Plansearch Ltd., Halifax, N.S., Canada.

Collection of offshore data in Canada has increased in the last decade with the existence of the offshore oil and gas industry. Government programs ensure that the operator of each well or offshore activity gathers oceanographic and meteorological data to pre-determined standards. The data are used for forecasting and for climatological studies. Data collection, analyses and uses are covered. Areas are identified where recent experience suggests ways of adapting data collection programs to optimize results. Data collection is expensive, but by careful planning and inter-agency co-operation, much useful information can be retrieved economically and efficiently.

T9 - Advanced Marine Vehicles

Tutorial Leaders : Dr. Charles Hsiung, Technical University of Nova Scotia, Halifax, N.S., Canada, Tim Edwards and Don Hussey, Eyretechnics, Dartmouth, N.S., Canada.

A general description of advanced marine vehicles including displacement and planing hulls, hydrofoils, hovering-crafts, multihull vessels and deep submersibles. Discussion of limits of displacement hulls, performance and applicability of hydrofoils and hovering-crafts, and use of submarines for commercial applications. Development and design of SWATH (Small Water-plane Area Twin Hull) ships. Resistance theory is applied to optimal mono-hull and twin-hull displacement ship design. Future prospects are explored.

T10 - The Global Positioning System : Basic Concepts

Tutorial Leaders : Dr. Gerald Lachapelle, Nortech Surveys, Calgary, Alberta, Canada, and Dr. Alfred Kleusburg, Department of Survey Engineering, University of New Brunswick, Fredericton, N.B., Canada.

A non-mathematical overview of the Global Positioning System (GPS). Satellites - The GPS Satellite, constellation of prototype satellites, final 21-satellite constellation and deployment, constellation coverage, ground tracking stations. Signals - concepts behind GPS signal structure. Measurements - propagation and range-measuring concepts, pseudo-ranges and carrier beat phase measurements. Receivers - components and functions. Positioning - Static and kinematic. Accuracy -satellite constellation geometry and positioning accuracy. Dilution of Precision concept, effect of constrained solutions. Impact - policies and effects of the U.S. Federal Radionavigation Plan, size of user community, impact on positioning professions and society at large, speculations on the future of high-tech positioning.

T11 - Marine Applications of Finite Element Analysis

Tutorial Leaders : Dr. James Warner, Claude Desrochers and Greg Nigh, Martec Ltd., Halifax, N.S., Canada.

A methodology for analyzing marine structures and components using the finite element method, directed at the novice finite element user. Application include offshore structures, ships and instrumentation housings. Subject areas : 1.) Introduction to theory of finite elements. 2.) Representation of loads on large marine structures and structural components. 3.) Performing the finite element analysis. Special areas addressed : modelling guidelines, fluid and structural modelling procedures, effects of added mass on natural frequencies of structural vibration, accuracy of finite element analysis. The finite element analysis program VAST-PC is used for demonstration.

Registration for Tutorials :

Tutorials will be held on Monday, Sept. 28, 1987 in the World Trade and Convention Centre. T1 to T5 will run concurrently from 0900 to 1200; T6 to T11 from 1400 to 1700. The registration fee for a single tutorial is \$50.00 (Cdn.). Attendance will be limited, and early registration is highly recommended. Please indicate your choice on the Conference Registration Form. On-site registration will be on a space-available, first-come-first-served basis. For further details, contact : Dr. Ferial El-Hawary, Technical University of Nova Scotia, P.O. Box 1000, Halifax, N.S. Canada B3J 2X4. Telephone : (902) 429-8300 Ext. 2053.

Technical Program

The Conference portion of Oceans '87 will open with a morning plenary session to provide a framework for the two-and-a-half days of technical sessions which follow. The more than 300 technical papers have been organized into themes which will be presented in ten parallel sessions. Presentations will be 20 minutes each, with time for discussion. Sufficient time has been set aside each day to permit attendees to participate fully in the Exhibition as well as the Conference. In addition to the regular technical sessions, there will be informal panel discussions, as well as special commercial sessions designed to allow manufacturers to present in-depth technical information on new products.

This preliminary program is intended to indicate to potential Oceans '87 attendees the breadth and depth of the technical content of the Conference. It is anticipated that some additions and deletions will be made, and that some sessions may be re-organized prior to the Conference.

Technical Program :

Plenary Session

The Ocean – An International Workplace

Chairman: Dr. P. Meyboom
Deputy Minister,
Fisheries & Oceans, Canada

Keynote Speaker: Dr. Walter Munk
Institute of Geophysics & Planetary Physics
Scripps Institution of Oceanography

Other Speakers: Dr. Jim Baker
Joint Oceanographic Institutions, Washington
From Peach Blossoms to Optical Disks:
Evolution of a New Ocean Technology

Mr. Dennis Ardu
British Geological Survey, Edinburgh
Developments in Marine Technology,
A Financial Impetus

Cold Ocean and Ice Research

ICE-1 Icebergs

Brian G. Sanderson
Statistical properties of iceberg motion in the entrance of
Lancaster Sound

Stuart D. Smith & Norman R. Donaldson
Dynamic Modelling of Iceberg Drift Using Current Profiles

L.W. Davidson
Long-Range Forecasting of Iceberg Season Severity

Stephen R. Osmer, Neal B. Thayer, Terry Mullane & Hugh McRuer
1987 International Ice patrol Preseason Iceberg Survey and
Seasonal Iceberg Severity Prediction

Sylvain de Margerie
Short Term Predictability of Iceberg Paths

ICE-2 Sea Ice and Structures

Steven J. Jones
Arctic Vessel Research at Institute for Marine Dynamics

Razek Abdelnour, G. Comford & Brian Wright
Ice Model Tests of the Kulluk Drilling Unit and a Comparison
to the Observed Full Scale Performance

Pietro de Bastiani & Dugald Wells
MV Arctic Vessel Performance Trafficability Program

J.P. Nadreau
Ice-induced Dynamic Behaviour of Structure

M. Wishahy, J.S. Pawlowski & D. Muggeridge
The Nonlinear Heave Motion and Wave Forces on a Partially
Submerged Sphere

ICE-3 Cold Ocean Instrumentation

S.W. Moorhouse, H. Melling
Deployment and Recovery of Oceanographic Moorings Through
Drifting Sea Ice

Kenneth E. Prada, D.E. Koelsch, W.E. Witzell, & R.C. Singer
An Arctic Remote Autonomous Measurement Platform

Stephen Gerald Lilley
Mechanical Design Solutions for Buoys to be Used in the
Marginal Ice Zone

Samuel P. Burke & James Morrison
A Meteorological/Salinity Argos Buoy for Deployments in Polar
Seas

ICE-4 Ocean and Ice

Dean A. Horn & Ola M. Johannessen
Winter MIZEX 87, Operations Overview

David J. Lapp & Robert W. Gorman
The Historical Ice Regime of the Sverdrup Basin and Byam
Martin Channel in the Canadian High Arctic

Max Perchanok, Carlos Ferregut, Clause Daley & Rick Brown
Generation of a Probabilistic Climatology for Arctic Sea Ice

Eric Leavitt
Real-Time SAR Support for Misex 87

Fifth Working Symposium on Oceanographic Data Systems

ODS-1 Data Base Management

I.A. Hardy & A.G. Sherin
What Value Old Data?

Robert V. Maher
GIS and Ocean Information Systems

Jacob Verhoef, Ron MacNab & John Woodside
Improved Methods for Handling Large Sets of Marine Gravity
and Magnetic Data

Lawrence J. Rosenblum, Marc Ostrow, Richard Mied,
Gloria Lindemann & Robert Matthey
A Menu-Driven Software Package for the Animation of Ocean
Hydrodynamics Numerical Simulations

Technical Program ...

ODS-2 Data Services

J.J. Gagnon, P.A. Bolduc & J.R. Keeley
Real-time and Near Real-time "in-situ" Data Available from
the Marine Environmental Data Services Branch, Department of
Fisheries and Oceans

J.J. Gagnon, J.R. Keeley & P.A. Bolduc
Temperature Analyses from Near Real-Time Oceanographic
Observations

Eugene Guy
Canadian Sea-Ice Information Data Base

Henry R. Frey
Innovative Tools for Management: Circulation Modeling and
Real-Time Measurements

ODS-3 Data Acquisition

Chairman: D. Steiger
Naval Research Laboratory

Daniel Steiger
A real time AXBT data acquisition and processing system using
a personal computer

A.S. Bennett
Shipboard Data Acquisition with a Microvax: A Pragmatic View

B.D. Loncarevic & E. Coldwell
Computer Based Shipboard Data Acquisition (Project Cigel)

Joseph P. Brust & B.A. Decina
An Ocean-Acoustic Data Acquisition and Processing System
Based on the Aptec Computer Systems 2400 Input/Output
Computer

ODS-5 Sea Floor Mapping

Chairman: R. Tyce
Director of URI Sea Beam Facility

Paul Jubinski & Shu-Fa Dwan
Applying Computer-Aided-Design (CAD) Workstation Technology to
the Display of Bathymetric Data Sets

Paul Jubinski & Jon F. Botsford
Applying Computer-Aided-Manufacturing (CAM) Technology to
the Automated Production of Physical Bathymetric Models

Pat St. Chavez, Jeffrey A. Anderson & James W. Schoemaker
Underwater Mapping Using Gloria and MIPS

Dimitri Alexandrou
A Computer Simulation Study of Bathymetric Sidescan Sonar

Christian de Moustier
On-line Sea Beam Acoustic Imaging

P.G. Simpkin & D.R. Parrott
Effects of Small Scale Seafloor Roughness on Acoustic
Reflectivity Measurements on the Newfoundland Shelf

R.L. Cloet & C.R. Edwards
Precision Real Time Swathe Sounding

Robert C. Tyce
Graphics Techniques for Display of Sea Beam Seafloor
Acoustics and Bathymetry

ODS-6 Workshop on Multibeam Seafloor Mapping Systems

Chairman: R. Tyce
Director of URI Sea Beam Facility

ODS-7 Satellite Remote Sensing

Robert Popham
Spacecraft Oceanography - From its Early Beginnings

Oceanographic Instrumentation

INS-1 Acoustic Doppler Current Profilers

Chairman: J. Whitman
Atlantic Oceanographic Laboratory

Gerald F. Appell, Robert G. Williams & James J. Sprenke
Development of a Real-Time Acoustic Doppler Current Profiler for
Charleston Harbour

N.A. Cochrane
Motion compensation for a shipboard Doppler current profiler,
considerations and implementation.

Kent Deines, Eugene Terray, Blair Brumsley &
Ramon Cabrera
Development of a Practical Coherent Acoustic Doppler
Current Profiler

N.R. Pettigrew, J.D. Wod, E.H. Pape, G.N. Needell & J.D. Irish
Acoustic Current Doppler Current Profiling from Moored
Subsurface Floats

John W. M. Whitman, N.A. Cochrane & Donald J. Belliveau
A microcomputer system for a shipboard Doppler current
profiler

E. Terray, B.H. Brumley & P.R. Heuchling
Coded Pulse-Coherent Doppler Sonar

Lars Petter Roed
A Preliminary Analysis of Bottom Currents Measured with
a Pulse-to-Pulse Coherent Sonar

INS-2 Acoustic Applications

Chairman: J. Sharkey
Oceano Instruments USA Inc.

Reg Cyr
Terrain Obstacle Avoidance Sonar For Autonomous Vehicles
Philip R. Staal
Use and Evolution of a Modular Digital Hydrophone Array

Manora K. Caldera
A Multi-frequency Digital Communication Technique for
Acoustic Channels with Multipaths

D. F. Jones & G.W. McMahon
Design and Performance Analysis of Barrel Stave Projector

B. L. Fanning & G.W. McMahon
A Vented Resonant-Pipe Projector

Alan Taylor, Alan Judge, Alan Duguid & Vic Allen
Automatic Data Acquisition System Installed In Offshore
Canadian Arctic Well: Monitoring Precise Temperatures By
Acoustic Telemetry

Patrick Barry
Telemetry in DREA Deep Water Acoustics

R. Coates
Acoustic Data Telemetry from Beneath the Ocean-Floor

Rodney Coates
Population Density Measurement by Acoustic Backscatter

Larry Mayer & Robert Courtney
Ultrasonic Measurement of Sedimentary Properties

Sudha S. Reese & Marco P. Sanquinetti
High Resolution Target Imaging for Active Classification

INS-3 WOTANS Technology

Chairman: F. Dobson
Atlantic Oceanographic Laboratory

D.D. Lemon, D.N. Knight, R.A.J. Chave & D.M. Farmer
An Acoustic System for Measuring Ocean Flows by Space-time
Scintillation Analysis

David D. Lemon & G. Duddridge
A Model to Estimate the Influence of Refraction on the
Operation of WOTAN Instruments

Winfield Hill
A Review of Modern Electronics for WOTAN Instrument

Fred W. Dobson
The Use of Wotans as Wind Sensors

INS-4 Water Column Samplers

Kichihiro Kawana, Akira Hoshika & Terumi Tanimoto
Water Quality Monitoring System for Oxygen Consumption
Studies in the Benthic Boundary Layer of the Seto Inland Sea,
Japan

D.L. Richards & H. Melling
An Oceanographic Bottle System for CTD Calibration

G.A. Fowler, B. Beanlands & W. Whiteway
Particulate In-Situ Sampler (PARISS)

INS-5 Standards and Calibration

Kim Saunders & Linda Knauer
Expendable dissipation profiler performance

Michael B. Manning & Richard W. Lancaster
XCTD Sensors Response Characterization

Kenneth D. Hill, Thomas M. Dauphinee & Donald J. Woods
The Uniqueness of the Practical Salinity Scale (1978):
Testing the Scale with Natural Seawaters

Eugene M. Russin & Donald C. Beaumariage
The Production Phase of NOAA's Next Generation Water
Level Measurement System

INS-6 Buoy Technology

Chairman: R. Canada
MTS Buoy Technology Committee

W. Brett Wilson
Concept for a New Ocean Monitoring Buoy Design

C.V. Nelson
A Low-Cost, Expendable Air-Deployed Buoy for Ocean
Surface Meteorological Measurements

R. Ian Dempsey
Ocean Tracker Performance During Canadian Atlantic Storms
Project (CASP)

George Fowler
The Development of Thermistor Chain Buoys for Use in Ice
Infested Waters

Ralph R. Miller & James K. Sharp
Autonomous Marine Sensors in the 1990's

C.C. Hsiung & Lu Qingyuan
Dynamic Analysis of a Wave Measuring Buoy System

James L. Hanlon
The ENDECO Type 1120 Station Keeping Buoy

Norman Lang & Kenneth E. Steele
The Empirical Determination of Noise Functions for NDBC Buoys
Equipped with DACT Wave Measuring System

Robert E. Timko
Improving the Accuracy of Local User Terminal (LUT) Position
Fixes

INS-8 STD / CTD Instrumentation

G.D. Youle & A.S. Bennett
General Purpose Digitizer

Kenneth D. Hill & Donald J. Woods
The Dynamic Response of the Two-Electrode Conductivity Cell

Neil L. Brown
A New Generation CTD Sensor System

INS-9 Oceanographic Instrumentation

G. Steeves & D. Sameoto
An Automated Real-Time Instrumentation System for
Biological Research

R. Ian Dempsey
Remote Telemetry Testing Module (RTTM)

Walter Worobec
Increased reliability for remote real time measurements

N.S. Oakey
Epsonde: A Deep Ocean Microstructure Profiler

William D. Morris & Michael Karweit
The NRL/JHU Towed-Array Instrument Package

Paul W. Krehl & H.A. Hornung II
Safety-Enhanced, High Rate, Non-Magnetic Lithium D-Size Cells for
Oceanographic and Naval Use

INS-10 Sensor Technology

Neil L. Brown
A Precision Pressure Transducer with FM output in UHF Band

K.E. Loudon
A Digital Ocean Bottom Seismometer with Event Detection

Samuel P. Burke
A Self-Orienting Ocean Bottom Seismometer Package for
Cabled-to-Shore Systems

W. Kroebel
A New Type of Pressure Sensor for Very Fast Measurements in Fast
CTD-Probes

David R. Green
A Fibre-Optic Refractive Index Sensor as a Laboratory
Salinometer

Russell R. Bessette, David F. Harwood &
Edward C. Brainard II
Laboratory Calibration of the Endeco Pulsed Dissolved Oxygen Type
1125 System

INS-11 Rapid Sampling Instruments

Ted Archibald
A Free Fall Tethered Instrument Platform

Edward C. Brainard II
Progress Report on the ENDECO Free Fall C.T.D.

INS-12 Acoustic Positioning

B.A. Trenholm & James A. Theriault
Resolving Angular Ambiguities at a Rotatable Horizontal
Line Array

Stephen W. Davis
Bearing Accuracies for Arctan Processing of Crossed Dipole
Arrays

Thomas K. Dettweiler & Michael H. Higgins
Acoustic Long-Baseline Navigation for Deep Ocean Dynamic
Positioning

Michael Grogan
High Frequency Band Acoustic Positioning Equipment Its
Evolution and Integration With Other Systems

Frederick H. Malz
Time Delay Estimation in Acoustic Localization and Tracking
A Survey

Harold E. Baggot & David Arnett
The Portable Acoustic Survey System An Integrated Deep-Ocean
Positioning and Navigation System

Marine Engineering

ENG-1 New Solutions to Old Problems

Carol L. Hervey & Donald J. Jordan
The Use of a Droque to Prevent Breaking Wave Capsizes of
Sailing Yachts

Elizabeth P. Signell & Mark W. Moeller
Bonhomme Richard "Reconstructed" with CAD

Peter Noble
Alternate Uses for Under-Utilized Offshore Drilling Equipment

Robin A. Williams
A Design Approach for Long Term Viability

ENG-2 Energy from the Ocean

Chairman: B. Davis
Nova Energy Ltd.

Yoshio Masuda, Tetuo Yamazaki & Yoshiyuki Ota
Study of Backward Bent Duct Buoy (BBDB)

Lloyd Lewis, Lloyd Trimble & Janet Bowers
U.S. DOE/PICHTR Cooperative 165 kWe Open-Cycle OTEC
Project

Won-Oh Song
An Overview of Korean Tidal Power Studies

E. van Walsum
Developing the Fundy Tidal Power Resource

J. Roger Farrell
The Installation of a Vertical Axis Hydro Turbine at
Annapolis Royal, Nova Scotia

ENG-3 Cables and Connectors

John Oliver & John Purdy
Fibre Optic Rotary Joints

J.R. Matthews & B.F. Peters
Effective Service Life of Variable Depth Sonar Tow Cable

Christopher Von Alt
A deep ocean cable for tethered vehicles

ENG-4 Marine Materials and Corrosion

Patricia Wagner & Brenda Little
An Evaluation of Microbiologically-Induced Corrosion in an
Estuarine Environment of Copper-Nickel Piping Systems
Selectively Treated with Ferrous Sulfate

Jorn Larsen-Basse, Bruce E. Liebert & KoMoe Htun
Evaluation of the Hawaii Deep Water Cable for Potential
Failures due to Erosion-Corrosion

K. Ganesh Babu & P.V.S.N. Raju
Corrosion of Steel in Concrete in Marine Environment - A Need
for Appraisal

Colin J. Sandwith & George D. Hugus
Failure Analysis Through Autopsy of Undersea Acoustic
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ENG-5 Towed Systems

J.G.G. Reid, P.C.F. Hurley & R.N. O'Boyle
Mininess: A Self-Trimming Multiple Opening and Closing
Plankton Net Frame Design

Roderick Mesecar, James Wagner & Walter Dillon
An Undulating Profiler

Alan R. Packwood
Fairings for oceanographic cables and instruments - have we
yet solved all the problems?

N.T. Allcott
High Level Language for Signal Processing Computers

ENG-6 Ships Design

Thomas Kearsey
Research Vessels - A Review Of Recent Design Innovations

Andrew P. Smith
The Planning and Methodology of Fishery Research Vessel
Design

J.H. Stel & E. van Abs
Containerisation and modulisation of ocean going equipment

Pauli Immonen, Richard Brooke, Jukka Pajala & Seppo
Lehtonen
Series Research Vessels - Tailored to Customer Requirements

A.J. Kerr, K. Manchester, R. Reiniger, J. Parsons, &
I. Majid
Designing a Multi-disciplinary Research Vessel

ENG-7 Ships Operation

Jack Morton
Science on a Shoestring - Research Vessel Conversion

Paul Jubinski
Mathematical Modelling of Ship Speed-Loss Due to Wind and
Seas

Claus Peter Thomsen
Optimum Ship Operation: Experiences with it and
Consequences from it for building & Driving Research
Vessels

L.M. Skinner, J.A. Adams, D.A. Arduis & J.W. Ramster
The Design and Operation of Government Funded Research
Vessels in the United Kingdom for use in the Marine Science
and Fisheries Research

ENG-8 Offshore Structure Analysis

Toshimasa Kawanishi
Tension Leg Platform Earthquake Motion Analysis

N. Srinivasan
Hydroelastic Modelling of Tripod Tower-Platform

Tom Y.H. Chen
General Nonlinear Analysis of Marine Risers

Cheng-Yuan Liou & Chih-Chi Chang
The Determination of Modal Damping Ratios and Natural
Frequencies from Bispectral Modeling

M. Robinson Swift & Kenneth C. Baldwin
Development of a Compliant Pile Aton System

C. Jebara, A.S.J. Swamidas & M. Arockiasamy
Response Of The Boat Landing System Of An Offshore Platform Due
To An Accidental Collision By A Supply Boat

ENG-9 Offshore Structures

K. Kokkinowrachos, I. Thanos & H.G. Zibell
Hydrodynamic Analysis of Some Energy-Conversion
Systems

K. Ganesh Babu & G.L.V. Raja
Hydrodynamic Behaviour of Semi-Submersibles

V.S. Raju, K. Ganesh Babu & P.S. Subramanian
Variation of Spectral Characteristics Due to a Cyclone

Jason Edworthy & Max Perchanok
Synthetic Real-Time Simulations Using Hindcast and Historical Observations

V. Sundar & S. Neelamani
Studies on Dynamic Pressure Distribution Around a Vertical Cyliner

R. Inoue
An Experimental Study on Reduction of Wave-induced Steady Heeling Moment Acting on a Lower-hull Type Semi-submersible

Peter Noble & Robert Smith
Mooring of Large Marine Structures in Seiche Prone Harbors

Robert S.C. Munier
Installation of an Ocean Haul Down Facility

ENG-10 DOLPHIN - An Autonomous Semi-Submersible

Bruce E. Butler & Stephen W. Maryka
Evolution of the DOLPHIN Multi-Vehicle Control System

D. Dinn, R. Burke, G. Steeves & A. Parsons
Hydrographic Instrumentation and Software for the Remotely Controlled Survey Vehicle DOLPHIN

J.G. Dessureault & R. Vine
A System to Deploy, Fuel and Recover DOLPHINS (Radio-Controlled Submarines) from a Vessel Underway

ENG-11 Fishing Gear and Technology

Chairman: R. Smolowitz
National Marine Fisheries Service

Ronald Joel Smolowitz
Status of Sea Scallop Gear Reserach in the Northeastern United States

C.G. Cooper
Development of Selective Fishing Gear

Clifford A. Goudey & Bill West
Reducing the Bottom-Impact of Alaskan Groundfish Trawls

Clifford A. Goudey & Paul Shuman
The Development of a Semi-Pelagic Trawl for Squid and Butterfish

John W. Watson & Wilber R. Seidel
Statutes of Selective Shrimp Trawling Gear in the Southeastern United States

Philip H. Averill & H. Arnold Carr
Use of Square Mesh in New England's Groundfishery

Charles J. Byrne & Janice R.S. Forrester
Effects of a gear change on a standarized bottom trawl survey time series

John F. Kenney, V.E. Nulk & A.J. Blott
Scallop Gear Selectivity Studies

H. Arnold Carr & Richard A. Cooper
Fate and Impact of Lost Commercial, Demersal Gillnets off the New England Coast

Guy Marchesseault
Gear Technology Needs for Fishery Management

Bill West
Impact of Commercial Bottom Trawling on the Red King Crab in the Bering Sea

ENG-12 Moorings

Henri O. Berteaux & Bryce Prindle
The Deep Sea Moorings Fishbite Problem

G.A. Fowler, J. Hamilton & R. Reiniger
Multiple Deployments of Aramid Fibre Mooring Lines

Jon D. Wood & James D. Irish
A Compliant Surface Mooring System for Real Time Data Acquisition

J.G. Dessureault
A Trawl Proof Bottom Mount for Oceanographic Instruments

P.R. Clay & H.O. Berteaux
The Performance Oceanographic Mooring (HIPOM)

Policy, Education and Technology Transfer

POL-1 International Issues

V.V. Zdorovenin
Co-operative Research: An Organizational Response of Marine Science to the New Challenges

Alexander L. Sutherland, Sandra Toye & Thomas Pyle
The Ocean Drilling Program: A Case Study in International Science

Noel Boston, Abu Bakar Jaafar & J.A. Bennett
International Cooperation in Pollution Control in Southeast Asia

Alan Ruffman, David Vanderzwegg & Ian Townsend Gault
Legal Jurisdiction over the Titanic

Ron Macnab
The 1982 UN Convention on the Law of the Sea and the outer limit of the continental shelf: some practical difficulties for wide margin states

POL-2 Ocean Space Utilization

Chairmen: C.N. Ehler and J.R. Vadus
NOAA/Natioanal Ocean Service

Charles N. Ehler & Daniel J. Basta
Strategic Assesment of Ocean Space Utilization

John R. Seesholtz
GEOSAT: Applications for Ocean Observations

Kenji Okamura
Future Ocean Space Utilization in Japan

John Ramster
Presenting Oceanographic Data Spatially: Dilemma or Opportunity

Gary Hill
Seafloor Exploration and Characterization: Prerequisite to Ocean Space Utilization

Robert Knecht
The Role of States in Ocean Space Utilization

John P. Craven
The Evolution of the Self-Sufficient Unmoored Floating Platform

Kenji Hotta & Wataru Kato
Socio-Environmental Impact Analysis of an Artificial Island

Don Walsh
Pleasure in the Ports: Can Recreation and Shipping Live Together

Gerhardt Muller
Ports and Artificial Islands: Development of a New Relationship

Sid Robinson
World Port Los Angeles: Project 2000

Takeo Kondo
Macro Oceanic and Atmospheric Management Project

R.H. Charlier & Chr. P. Meyer
Environmental purpose artificial island off the coast of Belgium

POL-3 Economics, Planning and Management

Chennat Gopalakrishnan
Institutional Constraints to Coastal Zone Management

Douglas Day
Company Responses to Changes In Government Policy on
Offshore Oil And Gas Exploration

Alfred W. Anderson
The Problems of Coastal Zone Planning for the 80's

Craig D. MacDonald
Nontraditional Ocean Industries for Hawaii

Biliana Cicin-Sain
Exclusive Economic Zones in the South Pacific: Economic
Development and International Competition

POL-4 Education, Training and Information Exchange

Robert B. Abel
Cooperative Marine Technology Program for the Middle East

Gaye Drescher
The Need for Information Transfer Systems in the Ocean
Workplace: A Case Study

Maurice P. Lynch
Ocean Policy Decision Processes

M.R. Nayak
On the Technological Requirements of Marine Education

Michael J. Brady
A Cross Cultural Analysis of Student Understanding of Marine
Science and Natural Resource Concepts Related to the Gulf of Maine

POL-5 Working at Sea

Colin Smith
Human Rights at Sea

Ian Professor Townsend-Gault
Regulatory Approaches to Offshore Safety

Peter W. Mushkat
Man Overboard: Are current standards sufficient to 'rescue'
the injured seafarer?

Cynthia Lamson
North Atlantic Fishermen in the Age of Extended Jurisdiction

Wade Elliott
The Seafarer of the Future

Mary Brooks & Chia Lin Sien
Future Research into the Seafaring Industry: An ASEAN
Perspective

Dennis W. Nixon
Liability Issues in the Operation of Oceanographic Research
Vessels in the United States

New Techniques and Strategies for Pollution Monitoring

MON-1 Panel Discussion: Monitoring for the Effects of New Developments on Biological Resources

Chairmen: A. McIver and P. Wells
Environment Canada

MON-2 Monitoring Strategies

Chairman: D. Green
Seastar

Douglas A. Wolfe
Marine Pollution Monitoring: Objectives and Design Criteria

Alan J. Meams
Order from Chaos? History of Chlorinated Pesticide
Contamination of the U.S. Coastal Fauna

A. H. Gillam, C.S. Johnston & J. Side
Development and Status of Effects Monitoring Programs in
North Sea

R.D. Nielsen, E.W. Hogue, J. Loehle & K. Mell
ODES Environmental Data Evaluation System

David E. Rathke & J.H. Hartig
Characterization of Toxic Substance Problems in the Great
Lakes

MON-3 Biological Monitoring Techniques

Chairman: H.A. Hall
Environment Canada

Coreen Hamilton, John Hoff, David Green &
Kathleen Thompson
Mussel Watch in Canada: Organic Contaminants in Mussels at Three
Sites Nationwide

Michael E. Bender, R.J. Huggett & H.D. Slone
Uptake of Polynuclear Aromatic Hydrocarbons by Oysters
(*Crassostrea virginica*) Transplanted to an Industrialized
Estuarine System

Jocelyne Pellerin-Massicotte & Emilien Pelletier
Evaluation of sublethal effects of pollutants with
biochemical indicators

J.S.S. Lakshminarayana & S.D. Jonnavithula
Phytoplankton and Water Quality of the Coastal Waters of the
Maritime Provinces, Canada

Tracy K. Collier & Usha Varanasi
Biochemical Indicators of Contaminant Exposure in Flatfish
from Puget Sound, WA

MON-4 Chemical Monitoring Techniques

Chairman: J. Lawrence
NWRI

V. Zitko
Analytical chemistry solving problems in pollutions and
mariculture

Clive MacGregor
Dissolved Methane

G.A. Packman & D.J. Thomas
Analysis of Beaufort Sea Sediment Data with
Recommendations for Future Programs

B. Humphrey & D. Hope
Winter Concentrations of Particulate and Dissolved Petroleum
Related Hydrocarbons in the Mackenzie River Delta Using
Conventional Grab Sampling, In-Situ Pumping and
Continuous-Flow Centrifugation

Andrew H. Gillam
Chemical Monitoring of North Sea Oil Installations

Raimundo Damasceno
A Modernized High Performance Photometric Comparator to
Measure Chemical Pollutants

MON-5 Pollution Monitoring Studies

Chairman: D. Gordon
Fisheries & Oceans Canada

Thomas M. Brosnan, Thomas L. Stokes & Angelika B. Forndran
Water Quality Monitoring and Trends in New York Harbor

Gary D. Brewer & Fred Piltz
Monitoring Changes in Benthic Communities Adjacent to OCS Oil
Production Platforms off California

Robert J. Brock
Hydrobiological Assessment of the Coastal Lagoons at Hugh
Taylor Birch State Recreation Area, Ft. Lauderdale, Florida

Noel Boston & Duncan Parish
Marine Wetlands - A Dwindling Resource

Alan R. Bunn & James M. Coe
Marine Debris: STOW IT!!

Zoe Lucas & Peter B. Eaton
A Survey of Persistent Litter on Sable Island Beaches

Organotin as a Pollution Problem

TIN-1 Introduction - Organotins : Science, Policy and Regulation

Chairman: J. Ludgate
International Paints
A. W. Sheldon
M&T Chemicals, Inc.

J. Ludgate
Organotin Antifouling Paints - Industries Position Today

A.W. Sheldon
Review of Human Health Effects From Exposure to
Organotin Compounds

(Speaker TBA)
A Progress Report of EPA's Special Review of TBT

(Speaker TBA)
The Status of the Organotin Issue in Canada

Olov Linden
The Scope of the Organotin Issue in Scandinavia

David M. Allison & L. Sawyer
The U.K. Ministry of Defence's Experiences, Practices
and Monitoring Programs for the Application, Maintenance
and Removal of Erodable Organotin Antifouling Paints

Vincent J. Castelli, Carl M. Adema, Deborah A. Houghton & Scott
R. Mangum
Organotin Antifoulants - Formulation and Release Rates

Paul Schatzberg
Organotin Antifouling Paints - Benefits and Risks, Real and
Unreal

TIN-2 Organotin Chemistry

Chairman: F. E. Brickman
U. S. Bureau of Standards
P. Michel
IFREMER

M. Stephenson, C. Alzieu, W. Bontoyan, P. Brannigan,
E. Crecelius, L. Hall Jr., E. Johnson, R. Huggett,
R. Laughlin, P. Seligman, J. Short, D. Smith & M. Waldock
An Analytical Intercalibration Among Eleven Laboratories For the
Determination of Organotin Compounds in Mussel Tissue and
Sediment

W.R. Blair, K.L. Jewett, G.J. Olson & F.E. Brinckman
Design and Progress of a Comprehensive International
Laboratory Speciation Intercalibration Study of a
Multispecies Butyltin Reference Material : Significance for New
Analytical Methods and Biofilm Testing

W. Edward Johnson, L.W. Hall, S.J. Bushong & W.S.E. Hall
Organotin Concentrations in Centrifuged versus Uncentrifuged Water
Samples and In Sediment Intersitial Waters of a Northern
Chesapeake Bay Tributary

J.R.W. Harris & J.J. Cleary
Particle Water Partitioning and Organotin Dispersal in an
Estuary

A.O. Valkirs & P.F. Seligman
Butyltin Partitioning in Seawater

Michael A. Unger, W.G. MacIntyre, & R.J. Huggett
Equilibrium Sorption of Tributyltin Chloride by Chesapeake
Bay Sediments

Peter M. Stang & Peter F. Seligman
Desorption of Butyltin Compounds From Marine Sediments

P.J. Michel
Automatisation of a Hydride Generation/A.A.S. System - An
Improvement for Organotin Analysis

C. L. Matthias & J.M. Bellama, F.E. Brinckman, L.W. Hall &
W.E. Johnson
Determination of Di- and Tributyltin in Estuarine Sediments
using Acidified Methanol Extraction, Hydride Derivatization
and Gas Chromatography with Flame Photometric Detection

B. Humphrey & D. Hope
Analysis of Water, Sediments, and Biota for Organotin
Compounds

TIN-3 Organotin Fate and Behavior Studies

Chairman: M. J. Waldock
U. K. Ministry of Agriculture, Fisheries and Food
P. F. Seligman
U. S. Naval Oceans Systems Center

J. Cleary & A.R.D. Stebbing
The vertical distribution of organotin in waters of
Southwest England

John Thain, M.J. Waldock & M.W. Waite
Changes in Concentration of Organotin in UK Rivers and
Estuaries Following Legislation in 1986

P.F. Seligman, C.M. Adema, P.M. Strang, J.G. Grovhoug & A.O.
Valkirs
Monitoring and Prediction of Butyltins in the Elizabeth River
and Hampton Roads, Virginia

TIN-4 Organotins : Bioconcentrations/Biodegradation

Chairman: John E. Thain
U. K. Ministry of Agriculture and Food
J. J. Cleary
Institute for Marine Research

Michael E. Bender, M.H. Roberts, Jr., H.D. Slone, &
P.F. DeLisle
Bioconcentration of Tributyltin from Sediments and Solution
by the American Oyster and Hard Clam

Jeffrey W. Short
Tissue Concentration of Tributyltin in Mussels (*Mytilus*
Edulis) Collected from San Diego Bay, California to Kodiak
Harbor, Alaska in Control and Contaminated Sites

John Thain, M.E. Waite & M.J. Waldock
Degradation and Chronic Effects Studies of TBT and DBT

R. F. Lee
Fate of Tributyltin in Estuarine Waters

P.F. Seligman, A.O. Valkir, F.R. Lee & P.M. Strang
The Fate of Tributyltin in Marine and Estuarine Systems :
A Question of Persistence

TIN-5 Organotin Toxicity and Effects Studies

Chairman: I. M. Davies
Department of Agriculture and Fisheries for
Scotland
R. B. Laughlin Jr.
Harbor Branch Oceanographic Institution

R.S. Carr & J.L. Hyland
Tributyltin Water Quality Criteria, Revised Assessment

Sandra M. Salazar, Brad M. Davidson, Michael H. Salazar,
Peter Stang & Kathy Meyer-Schulte
Field Assessment Of A New Site-Specific Bioassay System

Morris H. Roberts, M.E. Bender, P.F. DeLisle, H.C. Sutton, &
R.L. Williams
Sex Ratio and Gamete Production in American Oysters Exposed to
Tributyltin in the Laboratory

I.M. Davies
Effects of the Use of Tributyltin Antifoulants in Mariculture

P.E. Gibbs and G.W. Bryan
Imposex and Reproduction in the Common Dogwhelk

R.B. Laughlin Jr., P. Pendolay & R.G. Gustafson
Sublethal Effects of Tributyltin on Hard Clam Larvae
(*Mercenaria mercenaria*)

Steven J. Bushong, W. Scott Hall, W. Edward Johnson &
Lenwood W. Hall, Jr.
Toxicity of Tributyl Tin to Selected Chesapeake Bay Biota

Michael H. Salazar & Sandra M. Salazar
Tributyltin Effects on Juvenile Mussel Growth

M.F. Platter-Rieger & D. Lapota
Effects on " *Mytilus edulis* " Larvae Following Chronic
Exposure to Low Levels of Tributyltin

D.R. Smith & M. Stephenson
The Use of Transplanted Juvenile Oysters to Monitor the Toxic
Effects of Tributyltin in California Waters

TIN-6 Organotin - Summary and Recommendations

Chairman: H. E. Guard
Office of Naval Research
M. A. Champ
Science Applications International Corporation

(Speakers to be announced.)

Other Pollution Issues

OTH-1 Oil Spills

Chairman: R. Engelhardt
COGLA

K. Meikle
Countermeasures Development for Marine Spills: A Review of
Environment Canada's Contribution

Mark Reed, Chris Turner, Malcolm Spaulding, Don Dorson &
Oistein Johanson
Evaluation of Surface Drifters for Satellite Tracking of Oil
on the Sea Surface

Eric Anderson
Improved Oil Spill Model

Emilien Pelletier, C. Brochu, J.E. Desnoyers &
J.H. Vandermeulen
The Effects of Chemical Dispersion on Long-Term
Weathering of Crude Oil In Subarctic Environment

Ron J. Woznow
Joint Oil Spill Response Plan (JOSREP)

OTH-2 Marine Environmental Quality: Theory and Practice

Dale E. Buckley
Feasibility of High Level Radioactive Waste Disposal in Deep
Sea Sediments: Site Assessment and Sediment Barrier Properties

Howard Levenson, Richard Denison, Gretchen Hund, Nick Sundt,
Kathy Wagner & William Barnard
The Interplay Of Waste Disposal Policies In Estuaries And
Coastal Waters And In Other Environments

P.G. Wells, L. Harding, J. Karau & G. Packman
Marine Environmental Quality in Canada

S. Hurlbur
Water Quality Modelling - Halifax Inlet

J. M. Osborne & K. Karr
Environmental Code of Practice for Treatment and Disposal of
Wastes from Offshore Oil and Gas Operations

OTH-3 Estuarine Environmental Quality

Chairman: G. Mayer

W. Flint
Lake Ontario Environmental Quality: Are There Future
Surprises?

D.W. Stanley
Eutrophication in the Albemarle-Pamlico Sound System:
Symptoms and Causes

J.B. Pearce
Status of European Estuaries

L. Vee
Long-Term Trends in Conditions and Management of Water
Quality in Three Major U.S. Estuaries

N. West
Estuarine Quality and Public Perceptions: Narragansett and
San Francisco Bays

J.K. Summers, K.A. Rose, R.A. Cummins, & D.G. Heimbuch
Analysis of Long-Term Fisheries Data Using Categorical Time Series
Regression

J.K. Summers & K.A. Rose
The Role of Environmental Factors in Controlling the Success of Fish
Populations

J.K. Summers
Construction of Long-Term Time Series of Anthropogenic
Factors Affecting Fish Stock Abundance

OTH-4 Estuarine Governance

Chairman: L. King

T. Hennessey and D.D. Robadue
Lessons from the Experiment in Estuarine Governance

R. Burroughs & V. Less
Evaluation of Water Quality Management in Upper
Narragansett Bay

R. Bowen
Urban Harbors and Environmental Management: Boston and New
Bedford, Massachusetts

L. King & J. Kendall
State Capability and the Management of Galveston Bay

C. Wiggins & J. Anderson
Governance of Galveston Bay: Preliminary Considerations

M. Sproule-Jones
Governance of Water Quality in Hamilton Harbour

OTH-5 Biological Removal of Pathogens

Chairman: F. Cantelmo and T. Carter

G. Richards
Microbial Depuration of Shellfish: Historical Perspective

W. Canzonier
Design and Operation of Shellfish Depuration Plants

T. Carter
Depuration Plant Studies: Viral and Bacteriological Elimination

H. Kator
Microbial Evaluation of On-Bottom and Containerized Relaying of Shellfish in Chesapeake Bay

F. Cantelmo
Siphon Extension as a Potential Indicator of Microbial Depuration Efficiency in the Hard Clam, *Mercenaria mercenaria*

M. Sobsey
Persistence of HAV and Other Viruses in Bivalve Mollusks

G. Roderick
Depuration of *Vibrio* from Shellfish

OTH-6 Biotechnological Identification and Removal of Carcinogens and Pollutants

Chairman: S. Ahmed

R. Kocan
Bacterial and Cellular Indicators for Identifying the Presence of Environmentally Hazardous Compounds

R. Portier
Immobilized Cells in Biotechnological Applications for Hazardous Waste Removal

OTH-7 The 1986 Rhine River Pollution Event

Chairman: J.P. Massue and A.G. Alexiou

(Session Still Being Organised)

OTH-8 Aquatic Systems and Toxicants : Implications for Ecosystem and Human Health

Chairman: W.F. Graham

A. Andren, W. Doucette & R. Dickhaut
Chemical Property Estimation Techniques for Environmental Modeling

W. Strachan
Mass Balance Accounting of Persistent Toxic Chemicals in the Aquatic Environment

W. Sonzogni & K. Bro
The Risks Associated with Great Lakes Contaminants

Marine Sciences

SCI-1 Advances in Physical Oceanography

Chairman: J. Hayes
NOAA/National Ocean Service

John G. Hayes, Henry R. Frey, Robert G. Williams, Joseph M. Welch & Wayne L. Wilmot
Real-Time Current and Tide Measurements in Numerical Modelling And Predictions For Charleston Harbor

Bruce B. Parker, Richard C. Patchen & Wayne L. Wilmot
The Circulation and Water Level Forecast Atlas: A New Product in Development at NOS

M. Trevor Scholtz, Daniel G. McGillivray, Boris Weisman & David A. Greenberg
Modelling of meteorologically forced currents on the Scotian Shelf during the Canadian Atlantic Storm Program

J. Craig Swanson & Katherine Jayko
Preliminary Results from A Simplified Numerical Model of Narragansett Bay

Stephen Peck
The Greenland Sea Project

Ted A. Kendaris & B.M. Eid
Seasonal Variations of Current Meter Measurements in the Vicinity of Sable Island, Offshore Nova Scotia

Walter E. Hanson, Donald L. Murphy & Iain Anderson
Drifting Buoy Data vs. Dynamic Height Measurements: A Comparison of Inferred Surface Currents in the Labrador Current

Michael Szabados, Charles Roman & Bob Taylor
Transmission of Real Time Oceanographic and Meteorologic Data From Ships

SCI-2 Ocean Surface Waves and Wind

S.K. Srivastava, R. Howell, & J. Walsh
Estimation of Ocean Surface Parameters using Ground Wave Radars

S.K. Srivastava, R.S. Srivastava, & J. Walsh
Effect of Off-Patch Scatter in Remote Sensing of Sea State

John Taylor
Calculation of Directional Wave Spectrum

William Perrie & B. Toulany
Results from Third Generation Modelling of Wind Generated Surface Gravity Waves

David E. Weissman, Fuk K. Li & Greg Neumann
Measurements During FASINEX

Stuart D. Smith & Peter C.P. Chandler
Spectra, Cospectra and Gust Factors for Gale-Force Marine Winds

Lloyd C. Huff & Robert G. Williams
Acoustic Remote Sensing of Wind Wave Directional Parameters

SCI-3 Measurement & Interpretation of Water Mass Distributions

David B. Fissel, Michael S.W. Bradstreet & Jon Moen
Water Mass Distributions in the Canadian Beaufort Sea

HFKO Hennig
Structure of water masses in the Agulhas retroflection as determined by metal concentrations

J.R. Keeley
Temperature Anomalies in the Northwestern Atlantic in 1986

J.D. Irish, J.M. Joy, R.M. Gelinis & D.D. Ball
Quasi-Real Time Measurements of Density in the Gulf of Maine

Alexander B. Polonsky & Toumany Camara
Large-Scale Tropical Atlantic Circulation and Meridional Heat Flux

SCI-4 Marine Biology

N. Balch, H. Price & T. Collins
Patchwork: Mesocosm tank studies on marine plankton patchiness

Stephen Bates & James Snow
Fluorescence Induction of Chlorophyll-A For Monitoring The Physiological Condition Of Phytoplankton And Macroalgae

Bruce H. Corliss

Recent Advances in Benthic Foraminiferal Ecology:

Implications for Oil Exploration

Jeffrey L. C. Wright

Marine Pharmaceuticals - A Sunken Treasure?

James S. Craigie, Peter Shacklock & Donald Robson

Seaweed Aquaculture in Nova Scotia

SCI-5 Tidal Power: Biological Considerations and Modelling

Chairman: W. Queen
East Carolina University

Donald C. Gordon
Intertidal Ecology and Tidal Power Impacts

Graham Daborn
Tidal Power Impacts

M.J. Dadswell & Roger A. Rulifson
Mortality of Fish Passing Through Tidal, Lowhead Hydro-Power Turbines and Possible Mitigation Strategies

Dave DeWolfe & Sylvain de Margerie
3D Tidal Modelling of Cumberland Basin

SCI-6 Fish Stock Assessment

Melvin L. Cross
A System for Binding Quotas and the Optimization Behaviour of a Fishing Firm

V.S. Chandrasekaran & R. Natarajan
An Assessment for Conservation of Cultivable Juvenile Fish Stock In Pichavaram Mangrove, Southeast Coast of India

Donald R. Maynard & D. Webber
Monitoring the Movements of Snow Crab (*Chionoecetes Opilio*) with Ultrasonic Telemetry

T.J. Kenchington
Management of Newly-Exploited Fish Resources

C.P. Berman
Random or Fixed Grid Sampling for Resource Assessment; a Possible Solution to the Dilemma

SCI-7 Coastal Currents and Sediment Transport

G. Drapeau, B. Boczar-Karakiewicz & D.L. Forbes
Near-Bed Currents and Sediment Transport on the Inner Scotian Shelf During CASP

S. Davidson, Sylvain de Margerie & P. Hill
Sediment Transport Processes in the MacKenzie River Plume

T. Judge & D. Forbes
Measurements of Currents, Bottom Sediments, and Seafloor Disturbances During CASP

V. Sundar, P.N. Ananth & K.G.S. Sarma
Distribution of Longshore Currents and Sediment Transport Rates in the Surf Zone Off Paradeep India

S. Davidson, S. de Margerie & S. Hurlbut
Sedimentation Studies - Musquash Harbour

D.G. Hazen, D.A. Huntley & A.J. Bowen
UDATS - A System for Measuring Nearshore Processes

S. H. Davidson, J.V. Barrie & C.F.M. Lewis
The Degradation and Infilling of Iceberg Scours

E.A. Coy & F.L. Goddard
Siltation and Ocean Dumping Problems at Dalhousie, New Brunswick

SCI-8 Marine Products and Biotechnology

(This session is presently being organized.)

SCI-9 Satellite Navigation

G. Andrew Power B. Bradshaw & Michel Morin
Precise Navigation for High Resolutions Geophysics in Hudson Bay

Sam Kelly & Donald Newman
Marine Research Applications of the NAVSTAR-GPS Global Positioning System

Saxena
Absolute Positioning of Seafloor Stations Using GPS

Tucker
Intercomparison of Various GPS Receivers for Marine Positioning

Jerardi
Precise Marine Positioning by TRANSIT Multipass Acoustic Survey System

SCI-10 Deep Sea Minerals & Methods of Recovery

Chairman: M. Cruickshank
U.S. Dept. of the Interior

James W. Curlin, William E. Westermeyer & Rosina M. Bierbaum
Recovery of Mineral Resources in the Exclusive Economic Zone: Technologies and Competitiveness

Robert L. Schmidt, D.A. Larson, R.J. Morrell, & R.J. Willard
Developing a Sampling System for Seabed Crust Deposits

Yoshio Masuda
Cobalt-Rich Crust Mining by Continuous Line Bucket

John R. Toth & Craig A. Amerigian
Percussion Coring of Ferromanganese Crust and other Hard Seafloor Substrates

Harold F. Hennigar
Design of Devices to Measure Thickness and to Acquire Engineering Test Samples of Cobalt Crust

John C. Wiltshire & Gary M. McMurty
Sampling Consolidated Material by Submersible

M.E. Williamson & Richard A. Peters
Hard Rock Sampling With A Portable, Deepsea Coring Drill

P.D. Rabinowitz, L. Garrison, J. Baldauf, B. Harding, S. Herrig, R. Merrill, A.W. Meyer, & R. Olivas
The Ocean Drilling Program

Patrick J.C. Ryall
Drilling Sulphide Mounds

Underwater Work Systems

UND-1 Diving for Science

Chairman: F. Watts
C.A.U.S.

George Baron
An Autonomous Acoustic Positioning System For Divers

A.N. Kalvaitis, R. Rounds & H.B. Delery
A Mobile Undersea Ocean Laboratory

S.F. Watts
Cold Water Diving Training for Marine Scientists

Robert G. Hooper
Biogeographic affinities of the benthic communities of the Virgin Rocks, Grand Banks of Newfoundland

S.T. Beauchamp, J. Kerekes & R. Tordon
Optical Properties of Inland Waters in Atlantic Canada and their Relation to Research Diving

Norman A. Sloan
British Columbia's Diving Fisheries

Marshall L. Nuckols & Midn Holloway
Hydrodynamic Resistance Study of a Scuba Diver

UND-2 Manned Submersibles

Chairman: R. Cook
Harbor Branch Oceanographic Institution

T. Askew
Johnson-Sea-Link Submersibles' Role in the Challenger Recovery

R.A. Slater & D.N. Privitt
Delta Submersible: 1986/1987 East Coast USA Operations

G. Hawkes & S. Earle
Autonomous Submersibles for Subsea Research and Exploration

K.W. Kaulum
Utilization of U.S. Navy Submersibles for Oceanographic Research

UND-3 Underwater Imaging

Chairman: E. Kristoff
National Geographic Society

John R. Harper, Mark Hill
Unique Application of an Imaging Sonar Systems

Emory Kristof & Alvin Chandler
Mapping an Underwater Archeology Site with an Electronic Grid

Emory Kristof, William Hamner & Alvin Chandler
3-D Video and Computer Analysis of Fish Schooling

Frank M. Caimi & Robert F. Tusting
Laser-Aided Quantitative Sampling of the Sea Bed

Stewart E. Harris
Underwater Imagery Using an Electronic Still Camera

UND-4 ROV System Development

James R. McFarlane
The Evolution of Deep ROV Technology in Canada

G.R. Smith
Development of a 5000 meter Remote Operated Vehicle for Marine Research

C.T. Schafer, K. Manchester & D.L. McKeown
User Evaluation of the New DFO/EM & R Deep Ocean R.O.V.

James S. Collins
Advanced Marine Robotics as a Strategic Technology for Canada

UND-5 ROV/Submersibles Tools

David Hosom
ALVIN: New Electrical System

Jayson Durham & Dale Bryan
An Embeddable Multicomputer for Undersea Vehicles

Robert F. Tusting & Frank M. Caimi
Inertially Aided Navigation of Undersea Vehicles

Shigeo Yamamoto, Akira Ikeuchi, Yoshihiro Ejiri & Toshio Izawa
Remotely Controlled Jetting Buoy for Submarine Cable

Dana R. Yoerger
Telerobotics and Deep Ocean Science

D.R. Parrott, B. Imber & R.G. Campanella
SeaCone - A Cone Penetrometer For Use With The PISCES Submersible

C. David Flickinger & Edward S. Buzzelli
Primary-Secondary Battery System for ROV and Submersible Energy Source

Commercial Session

This new forum will permit companies to present technical information on new products or methods with commercial potential in some depth.

Chairman: Edward C. Brainard II, ENDECO Inc.

A. E. Shaw III, Service Argos, Inc.
The ARGOS Satellite Data Collection and Location System

L. E. Deveau, Acadian Seaplants Ltd.
Marine Plant Cultivation In Nova Scotia

D. Stone, Sippican Ocean Systems, Inc.
An Underwater Propagation Model for Personal Computer

T.J. Deveau, Oceanroutes Canada Ltd.
Acoustic Ray-Trace Diagrams for Underwater Applications

D. Myer, Oceanroutes Canada Ltd.
Design Considerations for Ship Installation of Computer Systems

J.D. McClintock, Seaconsult Limited
Advanced Ocean Wave Synthesis, Analysis, and Generation Software

M. Guberek, Global Imaging, Inc.
Image Processing Workstation for Naval Applications

J.P. Rooney, Sippican Ocean Systems, Inc.
The Reliability of Expendables

G. Bowers, Sea Data Corporation
A Novel Approach to Real-Time Wave Processing

G. Kontopidis, Sea Data Corporation
Advances in Real-Time Multi-Sensor Processing Instrumentation

R. Coates, Seimac Ltd.
Personal Computer Oceanographic Database (PCOD) for ARGOS Data

S.M. Skinner, ENDECO, Inc.
Triple Point of Water and Melt Point of Gallium Cells as Standards at Sea

R.S. Mernyk, ENDECO, Inc.
The ENDECOR Data Watch Adaptive Packet Telemetry System

SET SAIL FOR HALIFAX!



CALL FOR NOMINATIONS

OES ADMINISTRATIVE COMMITTEE

It is time again to invite you to submit nominations for the OES Administrative Committee (ADCOM). There are currently 21 members serving on the ADCOM, with seven whose terms end on December 31, 1987. Those whose terms are ending this year are: Joseph Czika, Rui deFigueiredo, J. David Irwin, Lloyd Z. Maudlin, Michael D. Serotta, Glenn N. Williams and William E. Woodward. It is possible to elect up to 30 members to the ADCOM.

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

The Nominations Committee seeks volunteers as well as nominations. In each case, the individuals nominated must express a willingness to be considered by the Nominations Committee and to appear on the ballot. They must provide a brief two hundred word biography listing professional activities, current affiliations and participation in IEEE activities. We would expect to have no more than sixteen candidates for ADCOM positions placed on the ballot. Please submit nominations and supporting material no later than August 15, 1987 to:

Stanley G. Chamberlain
OES Jr. Past President
Raytheon Company
1847 West Main Road
Portsmouth, RI 02871

HALIFAX HIGHLIGHTED

The chapter of the IEEE, Oceanic Engineering Society of the Canadian Atlantic Region, has been in operation for over two years. This chapter attempts to provide a rich technical program to increase the knowledge of society members at the IEEE local section level. Chapter meetings provide the individual members with the opportunity to meet colleagues having similar interests, in an informal, friendly atmosphere.

Our chapter here in Halifax, Nova Scotia tries to provide a regular program of varied technical presentations by experts.

The following is a summary of several of the chapter's activities and plans:

- "Knowledge-Based Image Processing with Application to Geophysical Interpretation"
Invited Speaker was Dr. A. N. Venetsanopoulos, University of Toronto.
- "Robot Vehicles for Hydrographic Surveying ARCS and DOLPHIN"
Dr. Don Dinn, of Bedford Institute of Oceanography, N.S.
- "Modern High Speed Array Processors"
Motorola Information Systems Ltd., Brampton, Ontario.

- "The Next Revolution in Digital Signal Processing"
Invited Speaker was Dr. Simon Haykin, McMaster University.
- "Applying Artificial Intelligence to an Unmanned, Untethered Vehicle"
Invited Speaker was Arthur Westneat from New Hampshire.

Professional Tours have been organized locally such as:

- Tour of Acoustics Research Vessel, "CFAV QUEST".
- Tour of an Ice-Breaker
- Tour of Radar Station
- Tour of the Oil Rig "ROWAN JUNEAU".

Social events in cooperation with the Student Chapter of the Canadian Atlantic Region.

All these activities were successful and were well attended.

Future Events are being planned, such as:

- "Underwater Acoustics — A Historical Prospective"
Invited Speaker is Prof. M. Schulkin, University of Washington, Seattle.
- "Higher Order Spectral Analysis"
Invited Speaker is Dr. C. L. Nikias, Northeastern University, Boston.

We WELCOME all of you here to Halifax for the annual meeting of OCEANS '87. See you soon.

Dr. Ferial El-Hawary
Faculty of Engineering
Technical University of Nova Scotia
Halifax, N.S., CANADA



Dr. El-Hawary received an M.Sc. in Electrical Engineering from the University of Alberta and the Ph.D. in Ocean

Engineering from the Memorial University of Newfoundland. She is a Professional Engineer in the province of Nova Scotia, a member of the Faculty of Engineering and directs the "Modeling and Signal Analysis Research Laboratory" at the Technical University of Nova Scotia. Dr. El-Hawary has published numerous journal papers and made contributions to several edited books in her area of research interest of modeling and seismic signal processing for identification of Ocean Subsurface Feature. Dr. El-Hawary is the founding chairman of the Canadian Maritime Section of the Marine Technology Society and the chairman of the Canadian Atlantic Chapter of the IEEE/Oceanic Engineering Society. She is also chairman of the Tutorial Sessions Committee and is a member of the organizing committee of the MTS/IEEE Oceans '87.

THE FUNDY TIDES — NUISANCE OR RESOURCE?

*George C. Baker, Executive Vice President
Tidal Power Corporation
Suite 1109, 5251 Duke Street
Halifax, Nova Scotia B3J 1P3*

In Nova Scotia, a peninsula with a neck 12 miles wide and a shoreline some 5,000 miles long, no one lives far from the sea. The tides are simply part of everyday life — a significant part in many lines of work or leisure. This is particularly true in the Bay of Fundy region, where mean tide ranges progressively increase from a modest 12 feet at Yarmouth to nearly 40 feet in the headwater regions. The tides in Minas Basin, reaching as much as 54 feet at springs, are among the highest in the world.

The very large tides of the Bay of Fundy would seem to entitle it to a prominent position in the context of tidal power. Yet history provides an astonishing contrast. Tide mills date back to at least the early Middle Ages, and were commonplace until the 19th century. For example, the modest tides of the Atlantic coast from Maine to the Carolinas were utilized for large numbers of mills which served mankind well over long periods. But with minor exceptions, Fundy went unutilized.

One exception was the first tide mill in North America, built at Port Royal (now Annapolis Royal) in 1607. The mill used water from the Lequille River, but there is evidence that tides contributed to the water in the head-pond. The other was a tide mill near Parrsboro in the 19th century. Perhaps an inhospitable coast, in many places uninhabitable, together with a relatively low population inland, can help to explain this contrast.

Hopes for Fundy in the modern era trace back to Dr. W. R. Turnbull, a Rothesay, New Brunswick engineer, who in 1910 proposed using the tides as a source of power. By that time, electricity had become a more or less common energy carrier and Turnbull advocated using tidal heads to run hydroelectric plants.

His ideas no doubt encouraged the first failure. A man named Clarkson, a physics professor at Acadia University, developed a so-called current generator, consisting essentially of a propeller encased in a tube providing intake and draft. It was proposed to install machines of this type in the high currents of Minas Passage and a joint stock venture, the Cape Split Development Company, was formed. It ran out of capital before any power was produced.

The Petitcodiac estuary was another early target for development. Turnbull proposed a scheme for that river in 1919, and in 1928 the Petitcodiac Tidal Power Company was formed and made vain appeals for government assistance in developing a site.

In the early 1930's, Nova Scotia Power Commission engaged Dr. Turnbull to make feasibility studies of sites in the Cumberland Basin area. The studies were completed, but costs were not competitive.

Study of a plant on the Petitcodiac and Memramcook Rivers to develop 76,000 HP continuously was conducted by the Government of Canada in 1945. It produced an adverse economic verdict, as did the Atlantic Tidal Power Programming Board, a joint effort by Canada, New Brunswick and Nova Scotia, in 1969.

The Tidal Power Review Board reported an opposite result in 1977 and the predicted margin of profitability widened in a 1984 Update of Review Board results.

What caused this turn-around in the apparent economic status of tidal power? An important factor was the real price of energy. It had dropped under the influence of technological advances and cheaper fuels from the dawn of the Industrial Revolution until the early 1970's, by which

time it amounted to about 5% of the original cost. Since then it has been trending upward.

Improvements in understanding of the resource and how best to harness it have also contributed substantially. Studies conducted since the 1960's have identified the best sites, incorporated modern technology into tidal plant designs and identified the most beneficial ways of utilizing tidal plant outputs.

The long period during which tidal power dwelt in the economic wilderness was a great spur to invention. If conventional hydroelectric machinery was too expensive for the low heads involved, it was tempting to think that something better might be found.

One logical approach was typified by Clarkson's current generator, which would avoid the cost of a dam. This is still a live issue: within the past few years research and development work sponsored by the National Research Council has centered on application of the Darrieus turbine as a current generator.

A different and far less hopeful approach has involved the use of ballasted floats, with energy recovered from the vertical motion through mechanical linkages of various and ingenious types. An early attempt along these lines was made by a Halifax inventor who chose an Atlantic coast site with a tide range of about 6 feet to test his idea. A more recent attempt utilized the larger tides of Fundy. The inventor found that his rock-ballasted boat, cables, winch

and 3600:1 speed increaser produced enough energy to run a 5-watt lamp for one hour per tide!

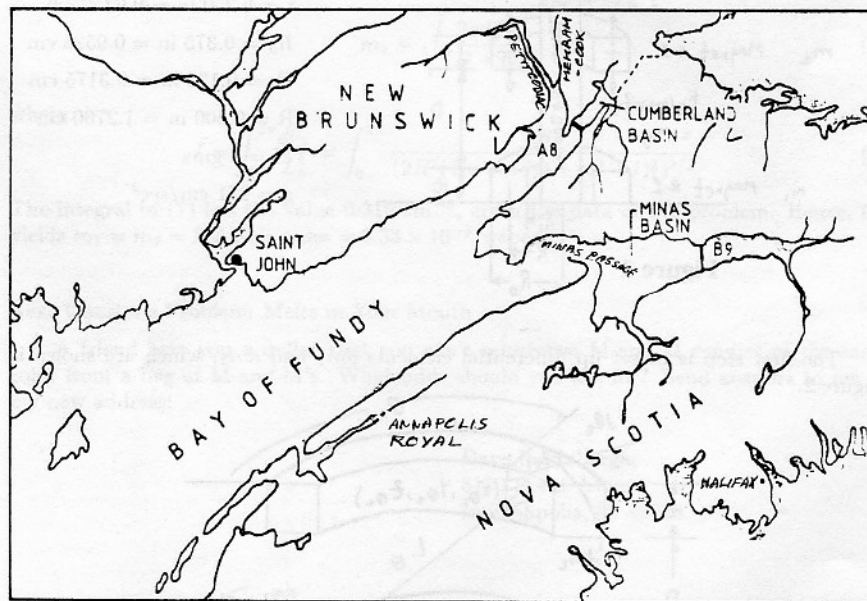
Altogether, more than 200 patents have been taken out, worldwide, for tidal power devices, and Fundy has inspired its full share of them.

The Tidal Power Review Board found that building large tidal plants at the head of Fundy would alter the tidal regime, decreasing range at the plant and increasing it in the lower Bay and Gulf of Maine. Although the effect of even the largest plant (12 cm increase of amplitude) would be small compared to predicted increases in sea level over the next century, it is a factor which may inhibit development of the most economic site, located in Minas Basin.

Other environmental effects are not considered serious or are probably capable of mitigation by appropriate design.

The Annapolis Tidal Generating Station, built to demonstrate the commercial operation of a large-diameter straight-flow turbine and commissioned in 1984, is providing valuable information regarding a number of technical and environmental aspects of large-scale tidal power development.

Will Fundy be harnessed? Many Nova Scotians hope so. They would be happy to see the Fundy tides, which constrain marine and recreational activities, create the need for dykes, muddy the estuaries and stress their ecology, transformed from an infernal nuisance into a valuable resource.



OTC '87 HELD AGAIN IN HOUSTON

The 1987 Offshore Technology Conference (OTC) was held again this past April 27-30 at the Astrohall in Houston, Texas. Total attendance was down approximately 7% from 1986, totalling 25,628. Most of the reduction was attributed to exhibiting personnel who did not make the trip this year.

Domestic exhibitors outnumbered foreign by a 60/40 ratio, in contrast to 1986 in which the situation was reversed. Most of the countries who were represented in 1986 returned this year, but in smaller numbers.

The technical program was well attended and included many outstanding papers. A total of 238 papers submitted from 39 countries was presented.

Preparations for the twentieth OTC in 1988 include a look back to the first OTC held at Albert Thomas Convention Center, Houston, in 1969. Some interesting comparisons with regard to IEEE involvement in the OTC can be drawn from the 1969 and 1987 programs. In 1969, technical sessions of IEEE interest represented approx-

imately 25% of the technical program. These sessions were clearly identifiable as IEEE related, such as "Electronics in Offshore Technology". Authors were associated with electronic or aerospace related concerns.

In 1987, IEEE involvement represented a smaller fraction of the program; approximately 15% of the sessions. Although there were some unmistakable IEEE sessions such as "Instrumentation and Fiber Optic Applications," most of the IEEE involvement was diffused into other areas, such as Subsea Production, Floating Production Systems, or Safety and Environment. Authors were associated with oil- or ocean-related firms.

In summary, IEEE involvement in the offshore industry is not shrinking, but is becoming more integrated into other technical areas. A significant area of IEEE involvement has been in the formation of a better data base of the offshore environment, above and below the sea surface. This enhanced knowledge has been a key factor in the success of many offshore installations and operations.

'TIS A PUZZLEMENT

Last Quarter's Puzzle: Magnetic Personalities

Last quarter's problem was to determine the pole strengths (m_1, m_2) of two opposing ceramic ring magnets, based on the information presented in Figure 1.

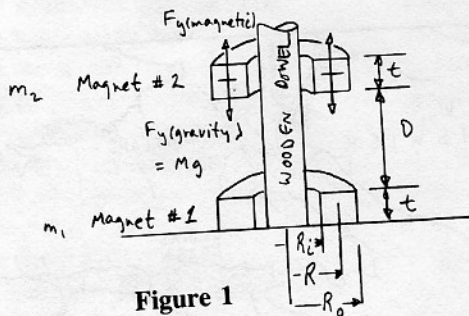


Figure 1

- $D = 0.625 \text{ in} = 1.5875 \text{ cm}$
- $t = 0.250 \text{ in} = 0.6350 \text{ cm}$
- $R_o = 0.375 \text{ in} = 0.9525 \text{ cm}$
- $R_i = 0.125 \text{ in} = 0.3175 \text{ cm}$
- $R = 0.500 \text{ in} = 1.2700 \text{ cm}$
- $M = 8 \text{ gms}$
- $g = 981 \text{ cm/sec}^2$

The first step is to set up differential elements dm_1 and dm_2 , which are shown in Figure 2.

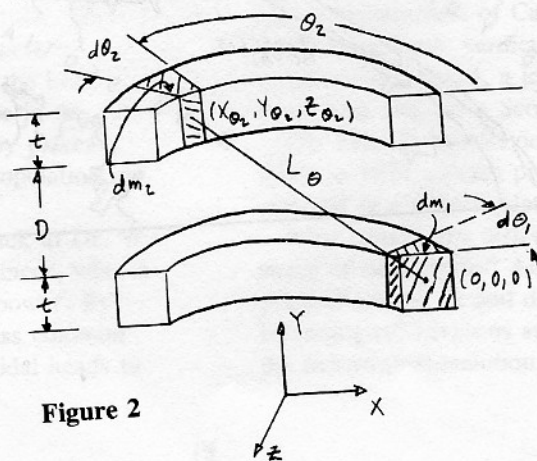


Figure 2

L_θ is the distance between dm_1 and dm_2 :

$$\begin{aligned} L_\theta &= \sqrt{(X_{\theta_2} - 0)^2 + (Y_{\theta_2} - 0)^2 + (Z_{\theta_2} - 0)^2} \\ X_{\theta_2} &= -R + R \cos \theta_2 \\ Y_{\theta_2} &= D + t \\ Z_{\theta_2} &= -R \sin \theta_2. \end{aligned} \quad (1)$$

Hence,

$$L_\theta = \sqrt{2R^2 - 2R^2 \cos \theta_2 + (D + t)^2}. \quad (2)$$

Each differential element can be treated as a point pole magnet, which repels the other with force dF :

$$dF = dm_1 dm_2 / L_\theta^2, \quad (3)$$

where $dm_1 = m_1 d\theta_1 / 2\pi$, $dm_2 = m_2 d\theta_2 / 2\pi$, and $m_1 = m_2$ if the magnets are identical.

The next step is to resolve dF into X , Y , and Z components:

$$\begin{aligned} \int dF_x &= 0 \text{ due to symmetry around magnet no. 1} \\ \int dF_z &= 0 \text{ due to symmetry around magnet no. 2} \end{aligned}$$

$$\begin{aligned} dF_y &= dF \frac{D+t}{L_\theta} = \frac{dm_1 dm_2 (D+t)}{L_\theta^3} \\ &= \frac{m_1 m_2 (D+t) d\theta_1 d\theta_2}{4\pi^2 L_\theta^3}. \end{aligned} \quad (4)$$

Hence,

$$\begin{aligned} F_{y(\text{magnetic})} &= \int_0^{2\pi} \int_0^{2\pi} \frac{m_1^2 (D+t)}{4\pi^2 L_\theta^3} d\theta_2 d\theta_1 \\ &= \frac{m_1^2 (D+t)}{4\pi^2} 2\pi \int_0^{2\pi} \frac{d\theta_2}{L_\theta^3} \\ &= \frac{m_1^2 (D+t)}{2\pi} \int_0^{2\pi} \frac{d\theta_2}{L_\theta^3} \\ &= F_{y(\text{gravity})} \\ &= Mg. \end{aligned} \quad (5)$$

Hence, solving (5) for m_1 (which equals m_2) yields

$$m_1 = \sqrt{\frac{2\pi Mg}{(D+t)I}}, \quad (6)$$

where

$$I = \int_0^{2\pi} \frac{d\theta_2}{L_\theta^3} = \int_0^{2\pi} \frac{d\theta_2}{(2R^2(1 - \cos \theta_2) + (D+t)^2)^{3/2}}. \quad (7)$$

The integral in (7) has the value 0.316 cm^{-3} , given the data of the problem. Hence, (6) yields $m_1 = m_2 = 265 \text{ unit poles} = 3.33 \times 10^{-5} \text{ webers}$.

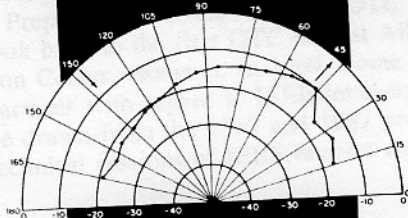
Next Quarter's Problem: Melts in Your Mouth

A friend bets you a dollar that you can't select two M-and-M candies of the same color from a bag of M-and-M's. What odds should you ask for? Send answers to me at my new address:

Dave Hollinberger
8120 Brent Avenue
Indianapolis, IN 46240

ANNOUNCEMENTS AND CALLS FOR PAPERS

SIGNAL ANALYSIS AND PROCESSING FOR SONAR SYSTEMS



October 1-2, 1987
Classroom W-12
1190 Barrington Street
Halifax, Nova Scotia



**Technical University
of Nova Scotia**
Continuing Education
Division

DESCRIPTION

The seminar will provide a comprehensive treatment of the pertinent mathematical and computational techniques of representing, analyzing, and processing deterministic and random signals in time and frequency domains. In addition, the basic theory of channel modelling and signal detection in a noisy environment will be described, and applications to undersea communications and submarine detection will be present.

WHO SHOULD ATTEND

This course is designed for engineers, mathematicians, physicists and technical managers who desire an understanding of sonar systems and signal processing. Both those with and those without familiarity with sonar can benefit from this course.

PREREQUISITES

There is no prerequisite for this course, however some understanding of probability theory and familiarity with engineering and scientific disciplines would be helpful.

REFERENCES

Class notes and paper reprints

PROGRAM OUTLINE

DAY I

THURSDAY, OCTOBER 1, 1987

8:30 REGISTRATION

8:50 WELCOME

Dennis Bicknell, Assistant Director,
Continuing Education, TUNS

- 9:00 **INTRODUCTION AND OVERVIEW**
Dr. Anastasios N. Venetsanopoulos
Introduction to undersea telecommunications
Limitations imposed upon underwater
telecommunications by the medium.
The sampling theorem. Continuous and
discrete time signals.
- 10:00 Coffee & Conversation
- 10:30 **INTRODUCTION AND OVERVIEW**
Continued
Representation of discrete signals
Elements of digital signal processing
Digital filters and their applications
- 12:00 LUNCH
- 1:00 **COLLECTION AND HANDLING
OPERATION**
Dr. Ferial El-Hawary
Types of Sonar Systems
Handling operation for surveying and data
acquisition
Energy sources and signal wave forms
- 3:00 **COLLECTION AND HANDLING
OPERATION** Continued
Operational Frequency ranges
Windowing for data storage
Sensors and Array sensors
- 4:00 **ADJOURNMENT**

DAY II

FRIDAY, OCTOBER 2, 1987

- 9:00 **CHANNEL MODELLING AND SIGNAL
DETECTION**
Dr. Anastasios N. Venetsanopoulos
Channel modelling
Reverberation and scattering
Measurements of random processes and the
detection of a known signal in a noisy
background
- 10:00 Coffee & Conversation
- 10:30 **CHANNEL MODELLING AND SIGNAL
DETECTION** Continued
Communications over fading dispersive
channels
Nonlinear filters and applications
Knowledge-based systems
- 12:00 LUNCH
- 1:00 **IMAGE/SIGNAL ANALYSIS**
Dr. Ferial El-Hawary
Pre-processing step (Heave Removal)
Modelling the heave
Use of Recursive Filters (Kalman filter)
Parallel Kalman filters, and use of systolic
array to design special purpose computers
- 2:30 Coffee & Conversation
- 3:00 **IMAGE/SIGNAL ANALYSIS** Continued
Use of Cross-correlation with
minimum-variance to extract some signal
information
Related physical parameters extraction.
- 4:00 **FINAL ADJOURNMENT**

COURSE CO-ORDINATOR AND SPEAKER

Dr. Ferial El-Hawary, P.Eng., M.Sc., received her M.Sc degree in Electrical Engineering from the University of Alberta, and a Ph.D. degree in Oceans Engineering from Memorial University of Newfoundland. She is a member of the Faculty of Engineering at the Technical University of Nova Scotia and directs the Modelling and Signal Analysis Research Laboratory at the university. Dr. El-Hawary has published numerous journal papers in her area of research interest of modelling and seismic signal processing for identification of Ocean Subsurface Feature, and has made contributions to several edited books. Dr. El-Hawary is the founding chairperson of the Canadian Maritime Section of the Marine Technology Society and chairperson of the Canadian Atlantic Chapter of the Oceanic Engineering Society of the IEEE. She is also

chairperson of the Tutorial Sessions committee and member of the working committee of the MTS/IEEE Oceans '87 organization.

SPEAKER

A.N. Venetsanopoulos is Professor of the Communications Group, Department of Electrical Engineering, University of Toronto, Canada. He received his M.S., M. Phil., and Ph.D. degrees from Yale University, New Haven, CT., in 1966, 1968, and in 1969, respectively. His research interests span the fields of digital signal processing, image processing, and digital communications. He has made many contributions to these areas and has published over 200 papers in technical journals and conference proceedings and has contributed to eight books. Dr. Venetsanopoulos is a member of the Association of Professional Engineers of Ontario, the Technical Chamber of Greece, the New York Academy of Sciences, and Sigma Xi, and has taught and consulted extensively internationally. A former Chairman of the Central Canada Council of IEEE (1980-82), Dr. Venetsanopoulos was President of the Canadian Society of Electrical Engineering (1983-86), Program Chairman of the 1978 and 1986 International Conferences on Communications, a Fellow of the Engineering Institute of Canada, Associate Editor for Digital Signal Processing of the IEEE Transactions on Circuits and Systems and Guest Editor of a special issue of the same Transactions on Digital Image Processing.

GENERAL INFORMATION TIME AND LOCATION

The seminar will be held in Classroom W-12 at 1190 Barrington Street from 9:00 a.m. to 4:00 p.m. Registration will begin at 8:30 a.m. outside the classroom.

ACCOMMODATIONS

The Nova Scotian Hotel is located within a short walking distance of the university. Room rates are \$54.00 single/double. To reserve, please call the Nova Scotian Hotel at 1-800-565-7164 or telex 019-21821. Please state that you are attending a Continuing Education Division seminar/course.

REGISTRATION FEE

The registration fee of \$395.00 is tax-deductible and includes all materials, registration, coffee and lunch.

TO REGISTER

Act now. Registrations will be accepted and confirmed in the order they are received. Simply fill in the attached form for advance registration and mail with fee to:

Continuing Education Division
Technical University of Nova Scotia
P.O. Box 1000
Halifax, Nova Scotia
B3J 2X4

OR

Call Linda MacDougall or Mary Meidell at 1-800-565-1179 or (902) 429-8300, Ext. 2456/2420. Cut-off date for advance registration is September 17, 1987. Invoicing policy will not be in effect on day of registration and all fees must be submitted before course attendance.

INFORMATION

For further information, please contact Professor Him Ahuja, Director, Continuing Education Division, Technical University of Nova Scotia, Telephone (902) 429-8300, Ext. 2014.

Continuing Education can arrange in-house technical and engineering courses for your organization or company at your site or at the University. For information call Dennis Bicknell at 429-8300 ext. 2031.

**OFFICIAL ABSTRACT
SUBMISSION FORM
FOR
PAPER PROPOSALS**

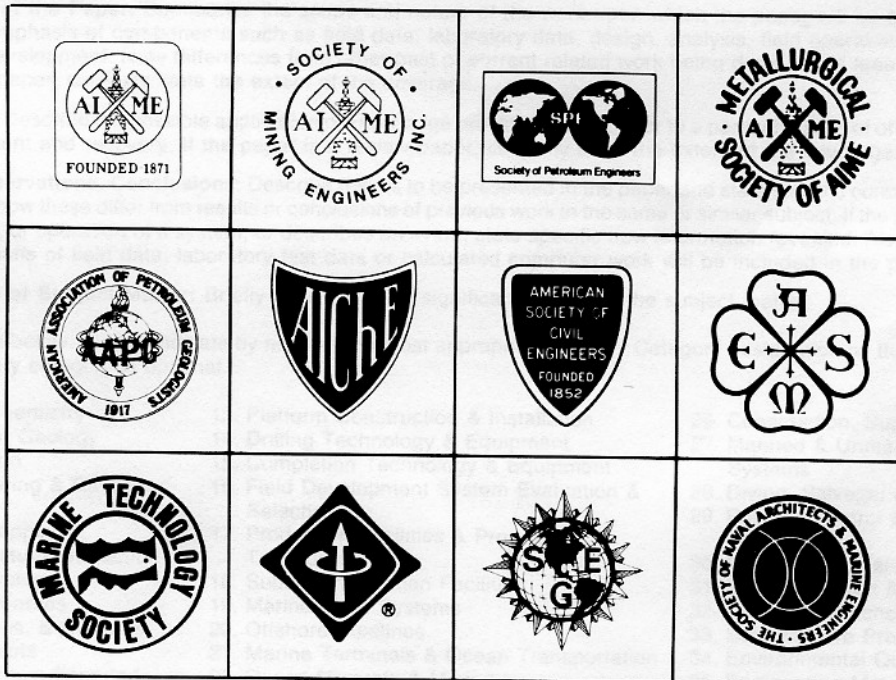


**MAY 2-5, 1988
HOUSTON, TEXAS**

DEADLINE FOR SUBMISSION—SEPTEMBER 15, 1987

AN ANNUAL CONFERENCE ON OFFSHORE RESOURCES AND ENVIRONMENT JOINTLY SPONSORED BY:

American Institute of Mining, Metallurgical, and Petroleum Engineers — Society of Mining Engineers — The Metallurgical Society — Society of Petroleum Engineers — American Association of Petroleum Geologists • American Institute of Chemical Engineers • American Society of Civil Engineers • American Society of Mechanical Engineers— Petroleum Div. • Marine Technology Society • Institute of Electrical and Electronics Engineers—Oceanic Engineering Society • Society of Exploration Geophysicists • Society of Naval Architects and Marine Engineers



**RETURN COMPLETED FORM TO:
PROGRAM DEPARTMENT, OFFSHORE TECHNOLOGY CONFERENCE**

Mailing Address:
P.O. Box 833868
Richardson, TX 75083-3868

Street Address (Express Delivery):
222 Palisades Creek Drive
Richardson, TX 75080

TELEX: 730989 SPEDAL

READ INSTRUCTIONS CAREFULLY

PAPER TITLE: _____

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 (with whom OTC will correspond on all matters) TELEPHONE: _____

COMPANY: _____

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ZIP: _____ COUNTRY: _____

AUTHORS: _____

(List names in order they should be printed in program. Provide addresses for all authors on separate sheet.)

Has presentation or publication of this material been made previously? ___ Yes ___ No

If yes, indicate place and date: _____

If member of a sponsoring society, please list: _____

FOR OTC OFFICE USE ONLY.	
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PC# _____	OTC Session _____

Subject Categories are listed on attached sheet. Please indicate number of subject heading that most directly applies to your proposal in Primary and Secondary (if appropriate) boxes. Primary (required) Secondary (optional)

Note to Authors: The OTC Program Committee will evaluate papers solely on the basis of information supplied on this form. Preference will be given to authors giving specific information in each of the areas outlined in the section entitled "Instructions for Abstract Completion."

DESCRIPTION:

APPLICATION:

RESULTS:

SIGNIFICANCE OF SUBJECT MATTER:

1988 OFFSHORE TECHNOLOGY CONFERENCE ABSTRACT SUBMISSION FORM

Deadline for Receipt—September 15, 1987

Note: All information requested on this abstract submission form must be included in order to be considered by the OTC Program Committee. Specific details regarding the nature of the work will be given priority consideration by the Program Committee.

GUIDELINES FOR AUTHORS

All Sponsoring Societies of the Offshore Technology Conference will participate in developing the technical program for the 1988 Conference. The Program Chairman for the 1988 Conference is Al Williams.

Individuals interested in submitting an abstract for consideration by the 1988 Conference Program Committee should review carefully the material included in this document. Specifically, potential authors should note that a **manuscript will be required for inclusion in the *Proceedings* Volume for each paper accepted for the 1988 Conference Program.**

The OTC Program Committee will evaluate papers solely on the basis of information supplied on this form. Authors **must** provide specific information on the paper proposal in **each** of the areas of the abstract section. OTC provides complimentary registration **only** for presenting authors who register on special author registration cards. OTC assumes no obligation for any other expenses incurred by authors for travel, lodging, food, or other incidental expenses.

INSTRUCTIONS FOR ABSTRACT COMPLETION

Please type and limit abstract to this page only

Solicitation of technical papers for the 1988 Conference will be made primarily with this Abstract Submission Form. The form contains space for the abstract that must be included for all proposed papers. This system permits the selection of papers for the program before manuscripts are written. Additional copies of this form will be supplied by the OTC Headquarters on request.

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

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

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

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

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

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

- | | | |
|---|---|---|
| 1. Marine Geology & Geochemistry | 13. Platform Construction & Installation | 26. Construction, Support, & Service Vessels |
| 2. Exploration & Production Geology | 14. Drilling Technology & Equipment | 27. Manned & Unmanned Submersible Systems |
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EVALUATION OF ABSTRACTS BY THE 1988 PROGRAM COMMITTEE

The following criteria will be observed by the Offshore Technology Conference Program Committee in selecting papers for the 1988 Conference.

1. The paper must not have had prior extensive publication or circulation. Publication in trade periodicals or other professional and technical journals will be considered extensive publication.
2. The paper should contain new knowledge or experience in some field of offshore resource and environment.
3. The paper must be technically correct and should be of interest to a reasonable number of people working in the field of offshore resources and environment. It may be theoretical or may present the results of laboratory studies, and it may state or analyze a problem. The paper may also be a review-type paper, but must be of significant value to the technical field.
4. The paper may present information about equipment and tools to be used in offshore technology. Such papers must show the definite applications and limitations of such equipment and should avoid undue commercialism and the extensive use of trade names.
5. **The abstract should have necessary clearance before submittal to OTC Headquarters. Prospective authors should provide information on any clearance problems when the abstract is submitted.**

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

A WORD ABOUT COMMERCIALISM . . .

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

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In accordance with U.S. Copyright Law, the Offshore Technology Conference must receive and maintain on file a copy of the Transfer of Copyright Form, signed by all authors of papers to be presented at the OTC.

PREPARATION OF MANUSCRIPTS OF ACCEPTED PAPERS

Authors of papers selected for the 1988 OTC program will be notified by mail in December 1987.

Authors offering papers for the program should fully understand that a manuscript will be required for each technical paper selected for the 1988 Conference. If selected, the manuscript will be printed in the *Proceedings* Volume to be sold at the Conference. The maximum desirable length for any paper is about 7,000 words.

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

Final manuscripts are due **February 12, 1988**, where author types the final copy of his/her manuscript on special forms provided by the OTC Office, then sends typed forms and loose illustrations to OTC Headquarters. The OTC staff completes the layout and printing of the paper.

ABSTRACT DEADLINE: SEPTEMBER 15, 1987

IEEE Society on Social Implications of Technology

Among IEEE societies, SSIT is unusual in that its scope encompasses *all* areas covered by the IEEE. *Every* IEEE member should consider joining.

Perhaps the best way to indicate what SSIT is all about is to mention some of the issues that it has been involved in. One category has to do with the societal impact of specific technologies: the effects of automation on the lives of office workers, how computers can be adapted for use by handicapped people, the use of electronic devices to help relieve the energy problem by facilitating time varying pricing, the controversy over nuclear power. The public policy issues are considered that span broad areas of engineering: risk assessment, star wars, environmental effects, government imposed secrecy in engineering and science.

Another important general area is that of engineering ethics - the professional obligations of engineers, and how this is affected by the conditions under which they work. Here we consider not only the effects on society as a whole, but effects on engineers themselves. Of particular interest are proposals for making it easier for employee engineers to operate as responsible professionals. SSIT presents its *Award for Outstanding Service in the Public Interest* to engineers who uphold ethical principles despite risks to their careers.

SSIT provides a forum for the discussion of these and other subjects in the pages of its highly rated quarterly magazine, *Technology and Society*, and via sessions that it organizes at various conferences and at its annual meeting. Since many of the topics it treats are of a controversial nature, differing views are often presented.

IEEE members can join SSIT after February 28 for half of the annual dues rate of \$12.00; the student rate is half that for regular members. Simply mail the following form, with check to:

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CALL FOR PAPERS

Low Frequency Acoustics in the Ocean

The October 1988 Special Issue of the Journal will be devoted to low frequency acoustics in the ocean. Progress in acoustical sensing systems constantly occurs and is often occasioned by supportive breakthroughs in allied technologies. Traditionally, the availability of new portions of the spectrum has led to an expansion of application opportunities.

This issue of the Journal seeks to examine applicable technology areas for beneficial acoustical developments at frequencies below 300 Hz to provide a base for assessing where new possibilities exist for exploiting the medium. Specific areas of interest include:

- Propagation Modelling Including Boundary Interactions
- Background Noise Effects
- Subfloor Modelling
- Reflection Characteristics
- System Cost Trade-offs and Trends
- Signal Processing Technology Including Tomography
- Transduction Including Array Concepts and Transducer Materials
- Supportive Ship Design and Construction Concepts

Applications to be addressed include communications, passive listening, telemetry, nuclear event detection, seismic profiling and echo ranging. Authors should highlight differences from higher frequency implementations to emphasize trends supporting lower frequency designs and to illustrate promising research areas. Papers should be sent to:

Michael Deaett
Raytheon Company
Submarine Signal Division
1847 West Main Road
Portsmouth, R.I. 02871-1087

The **deadline** for submission is **January 15th, 1988**. The usual peer review will be completed prior to acceptance.

Special Issue on Sound Reverberation and Electromagnetic Clutter

**Journal: IEEE Journal of Oceanic Engineering
January 1989 issue**

Submission deadline: April 15, 1988

This special issue is intended to put under one cover recent theoretical and experimental achievements from many disciplines in the areas of wave scattering from volume targets and rough interfaces. Emphasis is on forward and inverse solutions or methods, and related measurements for the remote detection and classification of scatterers such as the sea surface, seafloor, marine biota, and sea ice. The papers can cover topics anywhere in the full spectrum of theoretical and experimental accomplishments ranging from the theoretical description of scattering phenomena and analytical inverse solutions, to measurements of scattered fields and descriptions of signal processing algorithms. While this journal explicitly involves the ocean sciences, other disciplines such as medical ultrasound and ultrasonic flaw detection, where broadly similar scattering phenomena are investigated, are welcome.

Manuscripts should be prepared in accordance with the "Information for Authors" published in the back cover of any recent issue of the IEEE Journal of Oceanic Engineering.

Send manuscripts by the firm deadline of April 15, 1988 to:

Dr. Timothy K. Stanton, Guest Editor
Dept. of Geology and Geophysics
1215 W. Dayton St.
University of Wisconsin
Madison, WI 53706
(Telephone: (608) 263-8950 or 263-8960)

CALL FOR LECTURERS

IEEE members are invited to apply for the 1987 Distinguished Lecture Tour of Region 9 scheduled for November 2-18, 1987. The group will be composed of lecturers in the following fields:

- (a) Power: new developments in power system protection; power transmission (new developments, EHV, DC transmission, compact transmission lines); power distribution (new developments, underground systems); power system operation and control;
- (b) Computer: computer networks; microprocessor applications (control, industrial applications); robotics;
- (c) Communications: digital communications (public networks, packet switching, satellite communications, integrated networks); fiber optics; local area networks.

PACON 88

A Major Marine Science and Technology Congress for Hawaii and the Pacific

The third bi-annual Pacific Congress on Marine Science and Technology will be held from May 16-20, 1988 at the Ala Moana Americana Hotel in Honolulu. This major congress will focus on some of the new developments in marine technology that will vastly alter the way we will think about and the way we will use the ocean. The Pacific Congress on Marine Science and Technology, called PACON for short, is a forum to discuss the seeds of these changes that are here now. The Pacific Basin is where these seeds will germinate. It is now widely recognized in the Pacific Basin that marine science and technology has become increasingly important to economic development. With the declaration of 200 mile Exclusive Economic Zones (EEZ) countries now have effective control over the resources of wide ocean areas. These areas contain untapped wealth in terms of food, energy and minerals. In addition new transportation, engineering and navigation technologies are revolutionizing building and movement at sea.

PACON 88 addresses these technological trends and opportunities from a multi-disciplinary perspective. This will make PACON of major interest to planners, policy makers and administrators as well as to scientists and engineers. PACON 88 will give special consideration to the opportunities and challenges provided by these new technologies to the quality of life for developing island nations.

The Conference will be divided into two major areas: 1) Ocean Sciences and Technology to discuss new technological developments, and 2) Marine Resources Management to discuss the intricacies of wisely developing the great variety of resources available in the Pacific. Under these two broad categories, seventeen technical sessions will be held during the five days of the Congress. Specific topic sessions include Ocean Energy, Marine Mining, Marine Transportation, Technology of Fish Finding, Maritime Economics, Mariculture Technology, Marine

IEEE Sections in Latin America to be visited include Monterrey, El Salvador, Guatemala, Costa Rica, Puerto Rico, Panama and Colombia. The primary financial obligation for the tour will be borne by the lecturers.

The deadline for application is **JULY 1, 1987**.

Prospective tour participants should send letters indicating their interest in the tour, accompanied by a resume and a one-page summary of their proposed technical lecture, to: Mr. Arthur P. Stern, Transnational Relations Committee Chairman, c/o Ms. Barbara Ettinger, TRC Administrator, IEEE Headquarters, 345 E. 47th St., New York, NY 10017-2394.

Biotechnology, Marine Recreation, Ocean Robotics, Remote Sensing, Ocean Acoustic Systems, EEZ Mapping, Software Technology, Ocean Engineering Applications in the Pacific, Tsunamis, Marine Applications of the Global Positioning System and Sea Level Variability. In addition to these topic specific sessions in which a series of papers will be presented, there will be four workshops on the final day dedicated to the general discussion of relevant marine topics. Manufacturers and dealers interested in expanding their Pacific markets will be exhibiting their new products and developments throughout the Congress.

Authors of accepted papers will be notified by **August 31, 1987**. Full length papers will be due **November 30, 1987**.

Exhibits

An exhibition will be held in conjunction with the technical program. The exhibition area is immediately adjacent to the meeting rooms and will be scheduled to encourage maximum exposure to attendees. The exhibition booth fee is \$500 for an 8 x 10 ft. space, assigned on a first-come basis. If interested in details, check the box on the Registration Form; information on booths and costs will be forwarded to you.

Registration

Registration fee for the Congress is \$215 (US) prior to March 30, 1988, and \$240 thereafter; for members of sponsoring societies, registration is \$180 prior to March 30, 1988 and \$205 thereafter. Price includes luncheons, reception, banquet and a copy of the Proceedings. Spouse's registration is \$95, which includes luncheons, reception and banquet. Student registration is \$15 per day or \$45 for full Congress, including luncheons. Registration fees cannot be returned. Additional copies of the Proceedings will be available at \$40 (US) each.

Accommodations

A block of rooms have been reserved for the Congress participants at the Ala Moana Hotel. Reservations should be sent directly to the hotel. Special rates are available to PACON guests.

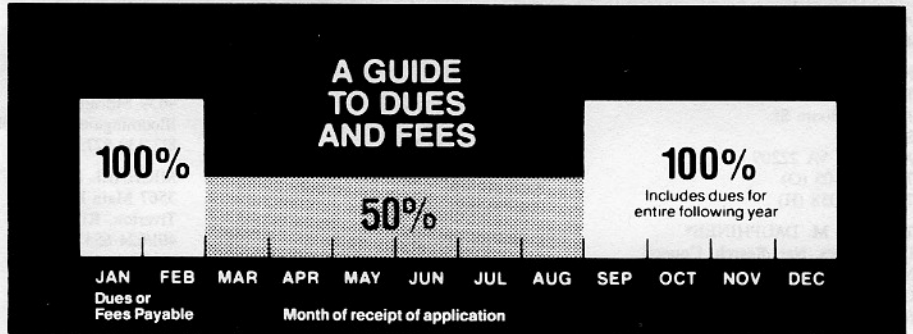
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Please take this opportunity, now, to broaden your outlook, open your mind to new concepts, new techniques, new fields of interest. There will be no better time. Return the Membership Application form below. (Students should contact their IEEE counselor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



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Name of educational institution _____

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