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Volume 6, Number 1 (January 1982)

The Solar Ocean Energy Liaison

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Solar OCEAN ENERGY Liaison

INCORPORATING
The OTEC Liaison

VOLUME 6, NUMBER 1
January 1982

OCEAN ENERGY COUNCIL MEETING DRAWS RECORD ATTENDANCE

The Eighth Open Meeting of the Ocean Energy Council held January 21st in the Faculty Club of George Washington University in Washington DC was a resounding success in more ways than one. While the attendance—well over a hundred—at least equaled if not exceeded earlier meetings, it also was the first opportunity for the ocean-energy/OTEC community to gather since the Ocean Energy Conference last June.

More importantly, the meeting provided a needed "shot in the arm" for the group, which has largely been in a state of limbo for almost a year, with DOE's OTEC funding for FY 1982 uncertain until only recently. (See the December 1981 issue of OE for details of DOE funding.)

The Ocean Energy Council (OEC), continuing its support activities as it has since its inception in 1979, scheduled a group of presentations, all geared not only toward those who have pursued OTEC/ocean energy for years, but also toward newcomers to the field. In fact, the mix of attendees has changed drastically in past years, going from a predominance of academicians and researchers to a blending of organizations looking toward design and construction of OTEC pilot plants and commercial plants.

The presentations made were as follows: *OTEC Status Report: Domestic*, by Fred Naef of Lockheed Missiles and Space Corporation, president of OEC; *OTEC Status Report: International*, by Richard Meyer of OE, secretary of OEC; *OTEC 40 MW Shelf-Mounted Baseline Design*, by Kevin Moak and Bill Rogalski of Gibbs and Cox.

No Low-Key Approach For This Group

In Naef's presentation he summarized the status of DOE's OTEC funding (see separate story in this issue) for both Fiscal Year 1982 and Fiscal Year 1983. Saying that "the high point" of ocean-energy successes in recent years was under the Carter Administration, when two major pieces of OTEC legislation were passed, he added that "things have gone downhill" since then, primarily due to the desire of the Reagan Administration to kill off OTEC entirely, whether due to budget-cutting or otherwise.

OEC's president also pointed out that there were several attendees at the meeting representing private financial institutions, and it is the "off-budget" area of financing that is receiving increasingly widespread attention from the OTEC community.

Among the concepts being investigated, Naef said, were the Maritime Administration's ship guarantees and capital construction fund, loan guarantees, and PURPA: the Public Utility Regulatory Policies Act. In addition, the monitoring of Reagan's attempt to abolish solar and other energy tax credits would continue as Congress deliberates this proposal by the Administration. OEC's lobbying activities, both on its own and in co-operation with other groups, will continue.

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Two new areas of possible off-budget funding are the Reagan Administration's proposal to establish "enterprise zones" which would include such depressed ship-building areas as Baltimore, and the deregulation of natural-gas prices, which would provide opportunities for tag-along legislation plus the expected price rises in non-OTEC energy that natural-gas deregulation would probably precede.

OEC apparently has earned a reputation as a forthright group, not only as "taking the lead in OTEC affairs", but within the entire ocean industry. In a story on the meeting appearing in *Ocean Science News*, a Washington DC-based newsletter, the following comments appeared:

"In contrast to many groups connected with ocean matters, the OEC is actively engaged in promotion of its interests, and apparently has little fear of offending anyone with the force of its arguments. No low-key approach for this group! It is now preparing a "white paper" to be used in the upcoming Congressional battle, and there is even some talk of establishing a 'political action committee' to promote OTEC."

Pending the results of the DOE Pilot Plant awards, after which OEC intends
(continued on Page 2)

OTEC GROUP MEETS WITH NOAA'S ADMINISTRATOR

On January 22nd, the morning following the 8th Open Meeting of the Ocean Energy Council in Washington (see story in this issue), a small group representing the OTEC industry met with Dr. John Byrne, the new administrator of the National Oceanic and Atmospheric Administration (NOAA), a branch of the US Department of Commerce.

Byrne, appointed by Reagan to the post, was sworn in last July. He asked Richard Norling, OTEC Program Manager of NOAA's Office of Energy and Minerals, to gather a small group representing OTEC industry to meet with him so that he could clarify the industry's goals and needs as well as begin to establish relationships in the field.

In attendance were Andy Anderson, Sea Solar Power; Tom Callahan, Ebasco; Don Farthing, TRW; Jim Lawless, NOAA; Richard Meyer, OE; Betty Moore, NOAA; Fred Naef, Lockheed; Richard Norling, NOAA; Pat Slattery, Ebasco; John Van Summern, United Engineers; and Jay Yaffo, Ocean Thermal Corporation. (Farthing, Meyer, Naef, and Yaffo are also directors of the Ocean Energy Council.)

The agenda-less meeting provided an opportunity to consider how NOAA and the OTEC industry could best work in concert, as well as a review of mutual expectations. Byrne, who is also the Commerce Department's representative to the Law of the Sea Conference, stressed that the Department's goals include increasing America's competitiveness in the world economy, stimulating economic recovery and growth, and effectively managing the oceanic and atmospheric resources of the United States.

Two points were clear by the close of the meeting: (1) that Byrne is very enthusiastic toward OTEC, and (2) that he will be aggressive within the Commerce Department in implementing the goals of OTEC commercialization.

Already familiar with the enormous export potential of OTEC plants worldwide, Byrne was perturbed but not surprised to learn of the activities of the Japanese, French, Swedes, and Dutch in OTEC (see story in this issue). Although of an academic background, Byrne repeatedly emphasized his desire to see OTEC commercialized by US industry throughout the world.

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THE SEA, INCLUDING:
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WAVE - TIDAL - CURRENT
OFFSHORE WIND - BIOMASS
SALINITY GRADIENTS

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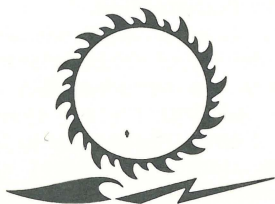
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to reconstitute its board of advisors to assure representation of all organizations active in the OTEC field, the group will reassess its strategies toward commercial implementation of OTEC.

For membership or other information write to the Ocean Energy Council, Box 57198, Washington DC 20037.

(A review of *OTEC Status Report: International*, presented at the OEC meeting by Richard Meyer, appears elsewhere in this issue.)

DEEP SEAWATER PIPELINE INSTALLED IN HAWAII

On December 22nd, 1981 the Natural Energy Laboratory of Hawaii (NELH) completed the installation of a 12-inch-diameter pipeline capable of providing 1500 gallons per minute of cold seawater to the laboratory facilities from a depth of 2,000 feet. In doing so the NELH becomes the world's only research facility capable of delivering both warm tropical surface seawater and deep cold seawater on a continuous basis for a wide variety of research projects.

The pipeline utilizes technology developed for the US OTEC research program, and is constructed entirely of plastics except for its stainless-steel pumps and fittings. This has been done so that no contaminants will be introduced into the water while it is being brought from the 2,000-foot intake depth to the laboratory area. Temperature rise in the water is a function of flow, and is expected to range from 2.7°C at 500 gpm to 1.0°C at 1500 gpm. Intake temperature is expected to vary between 5.8°C and 6.2°C over the course of the year.

The NELH was established by the State of Hawaii to promote the development of alternative energy systems for the benefit of the people of Hawaii, the United States, the Pacific Basin, and the world. It does this by making available to the research community top-quality research facilities and support personnel along with land area, uninterrupted warm and cold seawater flow, excellent solar insolation, and many of the state and federal permits necessary to utilize these resources. It is available to organizations in both the public and private sectors to use to conduct research projects in alternative energy and related areas.

The first major project was the Seacoast Test Facility, developed jointly with the US Department of Energy as an OTEC biofouling and corrosion research project. Other current projects include *in situ* marine-corrosion testing in the offshore research corridor, atmospheric-corrosion testing, and land-based OTEC mariculture experiments.

This project is funded entirely by the State of Hawaii.

For further details contact NELH at 1110 University Avenue, Suite 503, Honolulu, Hawaii 96826, (808) 942-2105.

THREAT TO DOE'S OTEC FY 1982 FUNDING AVERTED

Despite the \$20.8 million Bill for OTEC in Fiscal Year 1982 which was signed by President Reagan on December 4th (see the December 1981 issue of OE), the threat of its deferment or rescission arose last month.

On December 23rd, a conference was held in Washington between a Congressional delegation, represented by Senators Inoue of Hawaii and Hatfield of Oregon, and the US Department of Energy, represented by Under Secretary Fisk and Assistant Secretary Tribble. A representative of the Office of Management and Budget also attended.

The conference resulted in a decision for neither a rescission nor a deferment. The FY 1982 DOE budget for Ocean Systems/OTEC will therefore stand at \$20.8 million.

Regarding FY 1983, the proposed administration/DOE budget for *all solar energy* is understood to be \$67 million, thus assuring another lengthy period of deliberation between the Administration and Congress until next year's budget has been resolved.

NATIONAL GEOGRAPHIC FEATURES THE OCEAN—AND ITS ENERGY

The December 1981 issue of *National Geographic* features a multi-article section titled "The Ocean" in which Jacques-Yves Cousteau extols the virtues of OTEC and other ocean resources. (See the December 1981 issue of OTEC.)

The editors also devoted considerable space to ocean energy. Interestingly, while other energy forms such as tides and waves were discussed, the main emphasis was on OTEC. Significant excerpts included the following:

"Though costly, OTEC could provide fuelless and unending power to cities and islands in tropical regions, say its proponents. Others point to unsolved problems of size, siting, and technology. (The cold-water pipe for a full-scale OTEC plant, hanging half a mile deep, might be 80 feet in diameter.)

"And in a day of drastically curtailed federal budgets, such major projects as OTEC, deep-sea drilling, and ocean-scanning satellites now face cancellation or long delay."

(Editor's note: Finally, there is no mention of biofouling as an unsolved problem, as has consistently been the case in articles on OTEC in the general press. Three cheers for progress!)

OTEC STATUS REPORT: INTERNATIONAL

The following is excerpted from remarks by Richard Meyer, Editor of *Ocean Energy*, in his presentation at the 8th Open Meeting of the Ocean Energy Council held January 21st in Washington DC.

Since I began my active involvement in ocean energy over five years ago, no subject has held as much continuous interest within the ocean-energy/OTEC community as international activities in the field. Everyone wants to know what everyone else is doing!

Just before leaving Chicago, I reviewed our foreign-subscriber list and thought it might interest you to learn which of the world's nations monitor our field by subscribing to *Ocean Energy*. Alphabetically, they are Brazil, China (both Taiwan and the People's Republic of China), England, Finland, France, Germany, India, Ireland, Israel, Italy, Jamaica, Japan, Mexico, Monaco, the Netherlands, Norway, Sweden, Switzerland, the USSR, Venezuela, and Trinidad/Tobago.

Thus, all of the industrialized nations, as well as many other potential users, are watching OTEC.

As for which countries contain foreign subscribers, Japan leads the pack, as you might have guessed, followed by France, Sweden, Norway, the Netherlands, Jamaica, and Taiwan.

My talk today will detail OTEC activities in these most-active nations, with Japan discussed last. However before detailing the principal foreign OTEC activities minimal mention should be made of several areas of OTEC development. These reports are clearly labeled as rumors only, as we have been unable to obtain confirmation.

Philippines, Panama, Mexico

It is rumored that an American firm is currently in the process of attempting to obtain funding for site-specific feasibility studies for both the Philippines and Panama. I also know of an American company that made a similar attempt in Mexico in the last year.

India

Several sources have reported of activity in India.

Ocean Energy was told by a correspondent in New Delhi that in 1981 General Electric had proposed to the Indian Government that they do a feasibility study for a 25-megawatt OTEC plant, which was subsequently turned down since the cost would have been borne entirely by the Indians. It has also been reported (separately) that Delta Marine Consultants of Rotterdam, in

The Netherlands, has proffered an offer to do a feasibility study for a 10-megawatt or smaller plant specifically for the southern state of Tamil-Nadu. The cost of this study would be partially borne by the Dutch Government, with whom negotiations are currently under way.

As I cautioned earlier, these are unconfirmed rumors.

Ivory Coast

Clearly no rumor, however, is the OTEC activity taking place in the Ivory Coast—specifically in Abidjan, the site of French work that took place in the 1950s.

In 1980 a US group negotiated with the Ivory Coast Government to do feasibility studies on a cost-shared basis with the US Department of Energy. (See the April 1980 issue of OE.) DOE's Bennett Miller, then Program Director for the Solar Energy Division, flew to Abidjan. Shortly thereafter the project was canceled due to changes in cost-sharing arrangements.

However several European consortia attempted to pursue a similar project, and we understand that a contract was signed between the Ivory Coast Government and a French member of the European Economic Community to do a feasibility study, now under way. Iranie Schneider, a French company noted for its nuclear work, is understood to be performing the study through its consulting firm.

Taiwan

During 1980 there was a flurry of activity in Taiwan (see the January and September 1980 issues of OE) including visits to that country by several teams of US contractors. While several American firms are currently maintaining communication by mail, there has been very little forward movement during the last year. The Taiwan Power Company of Taipei seems committed to fossil fuel and nuclear power at this time. However further investigation of possible OTEC power plants in that nation by Japanese private industry is anticipated. This is due not only to the proximity between Japan and Taiwan, but also to the fact that there is a heavy infusion of Japanese industry already well established in that country.

Jamaica

Ocean Energy has published several articles (see the November 1979 issue of OE) describing the superlative conditions for OTEC in Jamaica. Not only is Jamaica in the heart of an area containing abundant OTEC resources, but the island has long been dominated commercially by facilities

of most of the world's largest aluminum companies. Jamaica is a major source of bauxite—the raw material from which aluminum is made.

Moreover, the production of aluminum requires extraordinary quantities of electric power—4% of *all* (commercial, industrial, and residential) electric usage, in fact. At present, the bauxite mined in Jamaica is exported for processing elsewhere.

While the Jamaica Ministry of Mining and Natural Resources has been observing OTEC's progress for years, it has only been with the election of Prime Minister Seaga a little over a year ago that Jamaica's tumultuous political problems have eased. This new stability has resulted in heavy loans to Jamaica from the World Bank, Sweden, and Norway, possibly paving the way for OTEC development by those two countries.

About six months ago, an OTEC team made up of firms from Sweden, Norway, and Finland visited the Jamaican Government, with the result that a consortium has been formed between these parties to develop OTEC. Site evaluations are already under way and will continue for another year, and heat-exchanger tests have been planned for those sites that appear to be most promising. Following this test period, a one-megawatt OTEC pilot plant is expected to be constructed.

Money is being attracted to Jamaica in great quantity for various purposes. Note the recent announcement of a 27-million-dollar TV and film-making center for the island's north shore.

Thus Jamaica has the resources and the need for OTEC power and a great deal of enthusiasm for OTEC. With the Scandinavians already there, Jamaica is certain to be the site of one of the world's first commercial OTEC plants.

France

The French not only were the originators of the OTEC concept (over 100 years ago), but also followed with Claude's work in Cuba in the 1930s and in Abidjan in the 1950s.

Jean J. Jarry, Scientific Attache of the Embassy of France in Washington DC, told us recently that "OTEC is not dead ... but living slowly". The French 1982 budget for OTEC is between \$3 and \$4 million, with funding going primarily for site studies, with some technical studies. The French are studying not only closed-cycle but also open-cycle systems, and the trend is toward open-cycle shore-based plants.

The decision whether or not to build a pilot plant will take place in 1983, most likely for the island of Tahiti. Adequate funds have already been set aside for a complete study of OTEC on Tahiti.

In addition, two French firms have set up a consortium to handle the Tahitian
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OTEC STATUS REPORT: INTERNATIONAL

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OTEC project, with investment to date of about \$1 million in private capital.

Japan

Clearly the runner-up internationally in the OTEC field, as of today, is Japan. But the lead the US currently enjoys is being narrowed rapidly.

The Japanese Government have continually increased their budget for all solar technologies from year to year, including OTEC. Details of their budgets, technical studies, and long-range OTEC program appear in the May, September, and October issues of *Ocean Energy*.

The most recent OTEC development—the Nauru demonstration plant, built by the Tokyo Electric Power Services Company and Toshiba Electric with 84% of the funding coming from the Japanese Government—has been amply described in recent issues. A Directory of Information on the Nauru plant appears on Page 2 of our November 1981 issue.

Recent information on technical results of the Nauru project will be detailed in our next issue.



US GOVERNMENT PROCUREMENT INVITATIONS AND CONTRACT AWARDS

Listed below are procurement invitations and contract awards related to OTEC in particular and ocean resources in general culled from the *Commerce Business Daily*. This is not to be construed, however, as a complete list.

Dec 1: Investigation of Disturbed Sensor Network (DSN) Concepts in Acoustic Ocean Surveillance: Contract N00014-81-C-0797, September 29th, 1981 (no RFP), \$199,907, awarded to Bolt, Beranek, and Newman Incorporated, 50 Moulton Street, Cambridge, Massachusetts 02238. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 1: Continue Research on Ocean-Floor Experiments on a Worldwide Basis: Contract N00014-80-C-0098, September 29th, 1981 (no RFP), for \$2,934,207, awarded to Columbia University, Box 20, Low Memorial Library, New York, New York 10027. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 1: Integration of Hydrothermal Energy Economics Related Quantitative Studies: Contract DE-AC-07-81D12314, for \$50,323, awarded to Engineering and Economics Research Incorporated, Vienna, Virginia 22180. US Department of Energy,

Idaho Operations Office, Contracts Management Division, 550 Second Street, Idaho Falls, Idaho 83401.

Dec 1: Analysis of the Potential Benefits of the USGS Regulations Concerning Safety of Human Life and Protection of the Environment on the Outer Continental Shelf: Modification Number 3 to Contract 143-08-0001-18630, \$90,115, awarded to Arthur D. Little Incorporated, Cambridge, Massachusetts. US Geological Survey, 12201 Sunrise Valley Drive, Reston, Virginia 22092.

Dec 1: Prediction and Measurement of Dynamic Properties of Offshore Structures: Contract 14-08-0001-20665, \$111,869, awarded to the Massachusetts Institute of Technology, Cambridge, Massachusetts. US Geological Survey, 12201 Sunrise Valley Drive, Reston, Virginia 22092.

Dec 2: Continued Oceanographic Research to Include Physical, Chemical, and Biological Oceanography, Environmental Acoustics, Marine Geophysics, and Ocean Engineering: Contract N00014-79-C-0004, September 10th, 1981 (no RFP), \$377,031, awarded to Oregon State University, Corvallis, Oregon 97331. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 2: Establish and Administer the Co-operative Research Associateship Program for the Conduct of Research of Interest to the Naval Ocean Research and Development Activity (NORDA): Contract N00014-81-C-0716, September 14th, 1981 (no RFP), \$303,235, awarded to the National Academy of Sciences, 2101 Constitution Avenue, Washington DC 20418. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 2: Development of Detail Design of Models and Production Fabrication Procedures Using Titanium: Contract N00024-81-C-5385, September 24th, 1981, for \$4,576,655, awarded to the Babcock and Wilcox Company, Power Generation Group, Nuclear Equipment Division, Post Office Box 504, Sunnyvale, California 94086. Navy Department, Naval Sea Systems Command, Washington DC 20036.

Dec 2: Development of Detail Design of Models and Production Fabrication Procedures Using Titanium: Contract N00024-81-C-5386, September 24th, 1981, for \$1,777,771, awarded to Lockheed Missiles and Space Company Incorporated, 1111 Lockheed Way, Box 504, Sunnyvale, California 94086. Navy Department, Naval Sea Systems Command, Washington DC 20036.

● **Dec 2: Assessment of Ocean Engineering Research and Development in Support of the Offshore Thermal Energy Conversion Program:** Contract NA-81-QA-C-159, \$75,000, awarded to the National Academy of Science, Marine Board, Washington DC 20418. NOAA Data Buoy Office, National Space Technology Laboratories, NSTL Station, MS 39529.

Dec 9: Parametric Study on Seawater Reverse Osmosis Desalting Plants: Contract

14-34-0001-1486, \$164,283, awarded to the Bechtel Group Incorporated, 50 Beale Street, San Francisco, California 94105. US Department of the Interior, Office of Water Research and Technology, 18th and "C" Streets Northwest, Washington DC 20240.

Dec 9: Evaluation of Selected Freeze Desalting Process for Suitability of and Interest in Commercial Development: Contract 14-34-0001-1467, \$119,908, awarded to Burns and Roe Industrial Services Corporation, 650 Winters Avenue, Paramus, New Jersey 07652. US Department of the Interior, Office of Water Research and Technology, 18th and "C" Streets Northwest, Washington DC 20240.

Dec 15: Application of Solar Hot Water to Closed-Cycle Aquaculture: DE-FG-02-81-R-510335.A000, \$40,370, awarded to Kara Farms Incorporated, Whitewater, Wisconsin 53190. US Department of Energy, Chicago Operations Office, 9800 South Cass Avenue, Argonne, Illinois 60439.

Dec 15: Fuels and Chemicals from Biomass Depolarized Water Electrolysis: Contract DE-AC-02-81-CE-90032.A000, for \$119,983, awarded to the Institute of Gas Technology, Chicago, Illinois 60616. US Department of Energy, Chicago Operations Office, 9800 South Cass Avenue, Argonne, Illinois 60639.

Dec 16: Conduct Deep Submersible Studies of Seamounts and Subsequent Laboratory Studies of Rock and Sediment Samples: Contract N00014-79-C-0472, September 18th, 1981 (no RFP), \$240,434 awarded to the University of California at San Diego, La Jolla, California 92093. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 21: Investigation and Validation of Deep Ocean Cable Burial (DOCB) System Cable Terminations: The contractor shall investigate existing alternative candidate approaches for mechanically terminating the DOCB umbilical cable, validate termination concepts, and report results of the investigation and validation. The umbilical cable is an electromechanical cable with an external KEVLAR armour package. The strength member has a nominal breaking strength of 300,000 pounds. Services will be provided under a firm fixed-price contract with an estimated level of effort of 580 direct hours. Contract performance will be 180 calendar days. Evaluation factors (in descending order of importance) are (1) Demonstrated background and experience of the firm in (a) evaluation of KEVLAR strength members and (b) termination of electromechanical cables. (2) Professional qualifications and availability of key personnel to be assigned to the project for the duration of the contract. (3) Capability for performing the electromechanical cable terminations and conducting termination evaluations and availability of facilities to perform these services. (4) Innovative design capability. Firms which meet the requirements de-

scribed are invited to submit a current SF 254, unless already on file with this office, and SF 255, US Government Architect-Engineer Qualifications. Firms desiring consideration shall submit appropriate data as described in Note 62 and shall indicate their size status on the SF 255. Firms responding to this announcement within 14 calendar days after the date of this announcement will be considered. No other general notification will be made. This is not a request for proposal. Direct all inquiries to Faye Warchal, (805) 982-5506/3473, reference 82-8274. OICC, Naval Civil Engineering Laboratory, Building 560-2, Code L23, Port Hueneme, California 93043.

Dec 22: Fluidized Bed Marine Combustion System: The Maritime Administration is soliciting expressions of interest from the commercial/industrial sector (equipment manufacturers, suppliers, and the like) in a co-operative cost-shared (50/50) study, analysis, and evaluation of the application of fluidized bed combustion systems to various forms of marine propulsion power generation (steam turbine and/or closed-cycle gas turbines). The analysis seeks to identify the technical and economic benefits of these systems along with the identification of future research and development requirements for the use of fluidized bed combustion systems aboard ships. Interested organizations should submit applicable information: statement of qualifications, brief description of past and present work relating to fluidized bed combustion, and a preliminary scope of the requirements for such a study and analysis. Expressions of interest must be received on or before the close of business on January 15th, 1982. Only those organizations willing to cost-share on a fifty-fifty basis for such a study should respond. US Department of Transportation Maritime Administration Office of Advance Ship Development (MAR-920), Attention F. X. Critelli, 400 Seventh Street Southwest, Room 4107, Washington DC 20590.

Dec 23: Continue Research on Wave Models of Turbulent Boundary Layer Velocity and Pressure: Negotiations are being conducted with Chase Incorporated, 14 Pinckney Street, Boston, Massachusetts 02114. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Dec 23: Financing Alternatives and Requirements for Solar Thermal Central Receiver Systems: Negotiations for a three-month contract are being conducted with Polydyne, 1230 Sharon Park Drive, Suite 61, Menlo Park, California 94025. (350) US Department of Energy San Francisco Operations Office, 1333 Broadway, Oakland, California 94612.

Dec 23: Modify and Conduct Underwater Development Demonstration of Float System: A contract is being negotiated exclusively with Grumman Aero-

Space, Bethpage, New York. Naval Air Development Center, Warminster, Pennsylvania 18974.

Dec 24: Analysis of Solar Survey Data in the Identification of Federal Research and Development Needs: Negotiations for Contract DE-AC-01-82-CE-30692 are now being conducted with Applied Management Sciences Incorporated, Silver Spring, Maryland 20910. Department of Energy, Office of Procurement Operations, Washington DC 20585.

Dec 30: Tether Cable Design, Fabrication, and Testing of a Deep-Sea Electro-Optical Mechanical Submersible Tether Cable: The electro-optical core will be capable of transmitting three-phase electrical power (about 60 Kw max) as well as optical data over approximately 23,000 feet of cable. The strength member will be an armor consisting of at least two layers of contrahelically wrapped, high strength PRD-49 material, which can be a composite. A tear-resistant waterproof jacket will cover the cable assembly. Interested firms fulfilling the following prerequisites are invited to respond for evaluation and consideration of company capabilities prior to solicitation of the requirement. (1) Previous experience in the design and fabrication of high-power, undersea electromechanical or electro-optical-mechanical cables with metallic or non-metallic strength members. (2) Previous experience in planning and performing qualifications testing of submersible tethers and establishing the relevancy of test data to operational performance. (3) Manufacturing equipment with adequate versatility to permit adjustment of lay lengths of the armor layers to insure that the cable will be torque-balanced and rotation-free. This equipment must also be instrumented to continuously monitor (and provide process control of) circularity, concentricity, dielectric diameter, and jacket thickness. (4) Electrical and optical measuring equipment adequate to determine characteristic impedance, corona, conductor resistance, insulation resistance, and optical continuity and attenuation for the cable. Such instrumentation need not be permanent capital equipment, but must be on hand during acceptance testing with verifiable calibration certificates. This is not a request for proposal. Only responses containing information adequate for evaluation will be considered. Written responses must be received not later than January 22nd, 1982 referencing "Tether Cable Source List". Commander, Naval Ocean Systems Center, San Diego, California 92152, Attention B. Walton, Code 4223, Telephone 714/225-6344.

Dec 30: System Analysis of Active Solar Absorption and Rankine Cooling System: Contract DE-AC-03-81-SF-11573, September 28th, 1981, awarded to Science Applications Incorporated, PO Box 1303, McLean, Virginia 22102, for a 12-month effort. US Department of Energy, San

Francisco Operations Office, 1333 Broadway, Oakland, California 94612.

Dec 30: Mini-Assessment of Future Environmental Problems: Mineral Independence: Contract 68-02-3723, RFP DU-81-B177, for \$49,609, awarded to The Futures Group, 76 Eastern Boulevard, Gastonbury, Connecticut 07033. EPA Contracts Management Division (MD-33), Office of Administration, Attention NCCM-6, Research Triangle Park, North Carolina 27711.

Dec 31: Define and Implement Baseline Display and MMI Concept for Phase II IUSS Oceanographic Processing Facility: Negotiations for Contract N66001-82-R-0104/EDS to be conducted with SDP Incorporated, 13848 Ventura Boulevard, Sherman Oaks, California 91423, as sole source based on background knowledge and expertise. Naval Ocean Systems Center, San Diego, California 92152, Attention E. Solan, Code 4222, Telephone (714) 225-2465.

Jan 6: Develop Biphase Turbine for Reverse Osmosis Desalination: Contract 14-340001-1487, for \$278,838, awarded to Biphase Energy Systems, A Research-Cottrell, Trans-America Delavel Joint Venture, 2800 Airport Avenue, Santa Monica, California 90405. US Department of the Interior, Office of Water Research and Technology, Contracts and Grants Center, 18th and "C" Street Northwest, Washington DC 20240.

● **Jan 6: Deployment of Mini-OTEC:** Contract DE-FG-02-81-CS-89026.A000, \$250,000, awarded to Lockheed Missiles and Space Company, Sunnyvale, California 94086. US Department of Energy, 9800 South Cass, Argonne, Illinois 60439.

Jan 7: Continue Research on Ocean Acoustic Tomography: Negotiations are to be conducted with Science Applications Incorporated, 1200 Prospect Street, La Jolla, California 92038. Office of Naval Research, 800 North Quincy Street, Arlington, Virginia 22217.

Jan 7: Preparation of an In-Depth Manual for the Identification of Phytoplankton at Ocean Disposal Sites: Negotiations are being conducted with Dr. Harold Marshall, Old Dominion University, Virginia Beach, Virginia. Environmental Protection Agency, Contracts Management Division, Equipment, Services, and Construction Contracts Branch, Cincinnati, Ohio 45268, (513) 684-7735.

Jan 13: Develop Climatological Summaries of Crucial Ocean Processes and Atmosphere-Ocean Interactions: Negotiations are currently being conducted on a sole-source basis with Compass Systems Incorporated, San Diego, California, for Contract 82-ABC-00053, estimated at \$29,000. NOAA, Northwest Administrative Service Office, Attention MB/NW3, 7600 Sand Point Way Northeast, BIN C15700, Seattle, Washington 98115.

