

Review & Forecast:

The Ocean Enterprise Concept: A National Strategy for Resource Development

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Today less than 1% of the annual resources consumed in the United States comes from the sea. Yet the March 1983 Exclusive Economic Zone (EEZ) Proclamation by President Ronald Reagan gave the U.S. exclusive jurisdiction over the resources of the ocean out to 200 nautical miles. To date, the potentially great rewards from the development of marine resources by the private sector have been greatly inhibited by the peculiar nature of the risks involved in such candidate projects.

In the spirit of this annual "Review and Forecast," we will concentrate on looking ahead, rather than to the past, in presenting a new strategy for launching a new era of awareness, practical development, and utilization of those resources—the Ocean Enterprise Concept. It is a set of ideas whose time has surely come. Born in May 1987, the Ocean Enterprise Concept has since been examined and molded and sharpened, along with gaining co-sponsorship by the National Science Foundation and the National Oceanic & Atmos-

pheric Administration's Sea Grant Program.

This rapidly maturing concept will be introduced at the Ocean Enterprise Workshop on February 20-24, 1989, at the Columbia Lakes Conference Center in West Columbia, Texas.

Several resource use areas and ideas show early promise: marine mining of coastal heavy minerals, ocean energy conversion, offshore waste treatment plants, mariculture (fish and shellfish), and installation of large, stable platforms at sea for aviation and space operations.

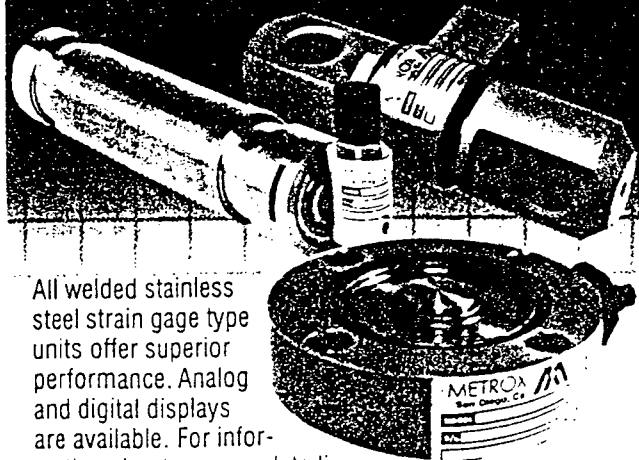
The construction of large (1-2 square kilometer) stable ocean platforms could not only offer this nation new commercial opportunities (coastal airports, etc.) but the technology for mobile overseas military bases to meet the future need of decreased reliance on overseas military bases. The U.S. has a worldwide military basing structure that will very likely dwindle significantly in the next ten years. Air bases in Panama, Spain, and the Philippines are becoming extremely expensive and less useful and available.

The Soviets have approached the problem differently by employing mostly movable or removable assets

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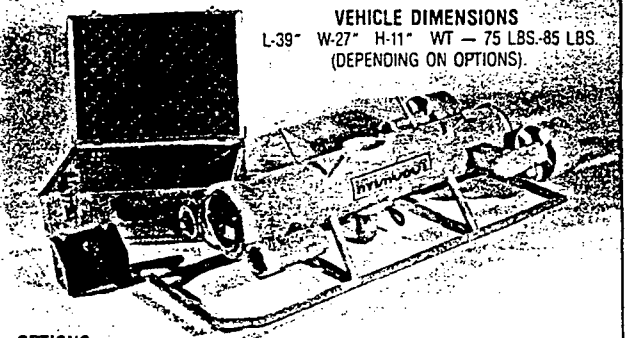
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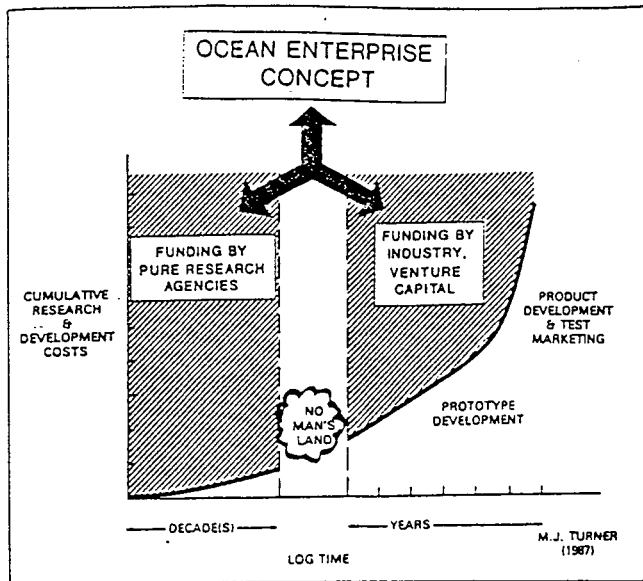
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(floating piers, tenders and repair ships, floating drydocks). Ocean bases could provide key aspects to hemispheric defense systems including border and internal defense. They can also serve as centers to suppress sabotage, terrorism, narcotics trafficking, and arms shipment; major weather stations for enhanced weather prediction and global climate studies; trans-ocean air traffic routing centers (with considerable fuel savings); alternative energy generating plants, both wave and thermal; and can serve as platforms to provide indirect U.S. military assistance to Third World countries (such as training, intelligence, communications, transportation, construction, medical supplies, physicians or disaster relief, and logistics).

It is only through a cooperative "pulling together" of government, academia, and industry that significant new areas of operational economic interest can be developed or current ones strongly bolstered. The original Stratton Report (*Our Nation and the Sea*, 1969) recognized the great basic potential of the oceans and provided a broad discussion of the many appropriate areas for economic development. An assessment at this time finds that: **Not one new major economic area has been developed in the ocean sector in the past 20 years.** The principal economic payoff areas remain those of shipping (merchant marine), fisheries, and offshore oil and gas. Heavy R&D investment has been made in such areas as mineral deposits (manganese nodules) and ocean thermal energy conversion (OTEC), but no practical business of net economic value has developed.

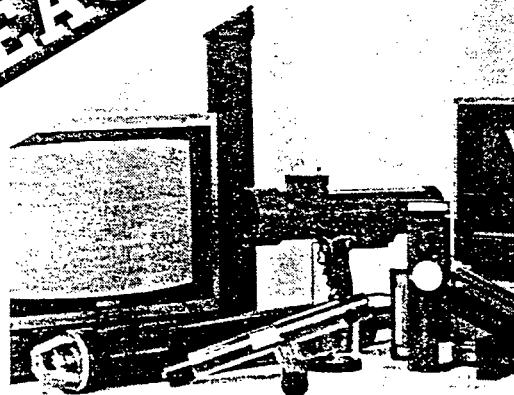
The Private Sector Environment

Broad technological and economic constraints have been suggested as the primary factors in preventing many of the Stratton Report goals from being achieved. Unfortunately, the development of these ocean resources has been constrained by the following factors: the lack of public/private venture infrastructure and legal/regulatory implementation strategies; environmental, economic, social, and political issues; and technical and engineering problems that arise from the "marinization" of land-based engineering concepts, technologies, structures, and facilities for use in ocean enterprises. However, the key limiting factors are really leadership, infrastructure, and venture capital (because the scales of risk are perceived to be large).

The infrastructure needs can be developed and supported by a federal inhouse incubator, an ocean-going "Fannie Mae," and a quasi-government non-profit corporation (chartered through federal enabling legislation). This quasi-government

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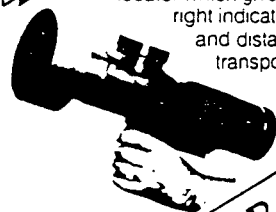


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corporation is needed to provide the limitation of liability to that normally accepted by the federal government and minimize the risk of intervenor legal action (similar to the trans-Alaskan pipeline's Alyeska Corp. or Comsat Corp.). Several national and international workshops have stated that the key technologies exist but have not been utilized in such a manner on a commercial scale.

It is in the interest of this nation to create organizational infrastructures that bring together the resources of government, industry, and the aca-

demie sectors. These would undertake large scale resource and technology development projects, where scales of time, risk, and/or magnitudes are too great for one sector to go alone to bridge the "no man's land" gap between research and development described in the accompanying illustration.

What Is an Ocean Enterprise?

Ideally an ocean enterprise should generate economic benefits from the development of ocean resources and technologies, protect and conserve ocean environments, provide the bene-

fits of a public service and reduce public risk, and support the nation's interests overseas.

It is also timely and desirable to foster new civilian and military partnerships to enhance this nation's competitiveness and economic growth. With current and future budget limitations (the trade deficit and the increasing national debt), it is also desirable to stimulate military/civilian synergy because projects of this scale (such as large ocean platforms) have costs that require multiple use benefits to society. Also these large projects must maximize the commercial spinoffs to distribute the construction and operation costs across a wider array of users.

Different kinds of ocean platforms (from ocean airports, mining-processing facilities, to recreational facilities such as floating hotels, resorts, etc.) will spin off entirely new commercial industries, providing significant public and private economic benefits.

Large scale ocean enterprises have to develop from a succession of smaller scale projects that perhaps develop for application in the shallower, near coastal waters, providing local public service benefits. These projects should have a dual use being initially developed with public-private sector funds for civilian use but engineered and evaluated with a military perspective and application in mind. Examples of these could be a moored floating ocean platform designed and engineered for a NIMBY (Not In My Back Yard) public service project such as a coastal airport or waste treatment facility (e.g., high temperature garbage processing and treatment plant). In the U.S., not a single major airport has been built since the early 1960s. By the year 2000, 80% of the U.S. population will live within 60 miles of the coast, and public air transportation, which has air space limitations today, will not be able to meet the demands for services in large U.S. coastal cities. The construction of stable ocean platforms for airports could be initially supported by public and private funding with repayment from user fees and capitalization of infrastructure.

Due to the increasing national debt and growing trade deficit, the policy of the new administration will be to reduce federal support for many programs for which such support would seem to be reasonable and appropriate from state and local governments and/or private sectors. The real question is: with the understanding that major increases in developmental funding from the federal government or from foundations are not to be expected, is there any



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basis for a major increase from the private sector?

What constitutes an attractive R&D investment opportunity in the private sector? A few critical elements which must be present to validate a "first class" investment risk are suggested below:

- A well-prepared development strategy and business plan
- Definable markets and specific paths to those markets
- A basis for prediction of "comfortable" profit margins
- Technological uncertainties well-defined and directly addressed by a planned R&D program
- Business plan adequately structured within the international and national socio-political and economic environment
- A direct identified path for return on investment (ROI).

'Triple Alliance' R&D

One mechanism for R&D funding may be the use of private sector partnerships. A triple alliance is a partnership of government, academia, and private capital sectors to establish long term and vigorous support for applied R&D in the oceans area. Support from the private sector is provided through an R&D partnership, thereby providing a direct path for technology transfer and market application directed by the general partners through agreements with "user" industries. The latter pay royalties to the partnership in return for manufacturing and marketing rights received. The royalties are used to provide return on investment to the partnership investors.

Government and non-profit foundation support is separately solicited by each project but has the added attractiveness for projects and grants by providing "leverage" based on the concurrent programs supported by the contracts with ocean enterprise corporation(s). In this way, a formal tie is established between the successful market application of project developments and the future financial support of the initiative itself. Industrial (private sector) participants are protected by limited investments and benefit both through tax credits and by distributions or individual "user" contracts. The general partners, through the partnership, provide sufficient isolation that anti-trust requirements are met. Finally, joint industry and government support of the center helps validate the products which are applied and sold through the private sector channels. This validation can be critical in reducing perceived risk and encouraging private sector investment. This mechanism can

provide a helpful "umbrella" for encouraging a significant increase in private sector investment.

This mechanism also emphasizes the role of the private sector. Rather than relying on a single major industrial developer, a team of industrial and investor partners, perhaps through a joint venture corporation, would be established to develop a particular area of great potential economic benefit. Such an area would be characterized by some of the following traits:

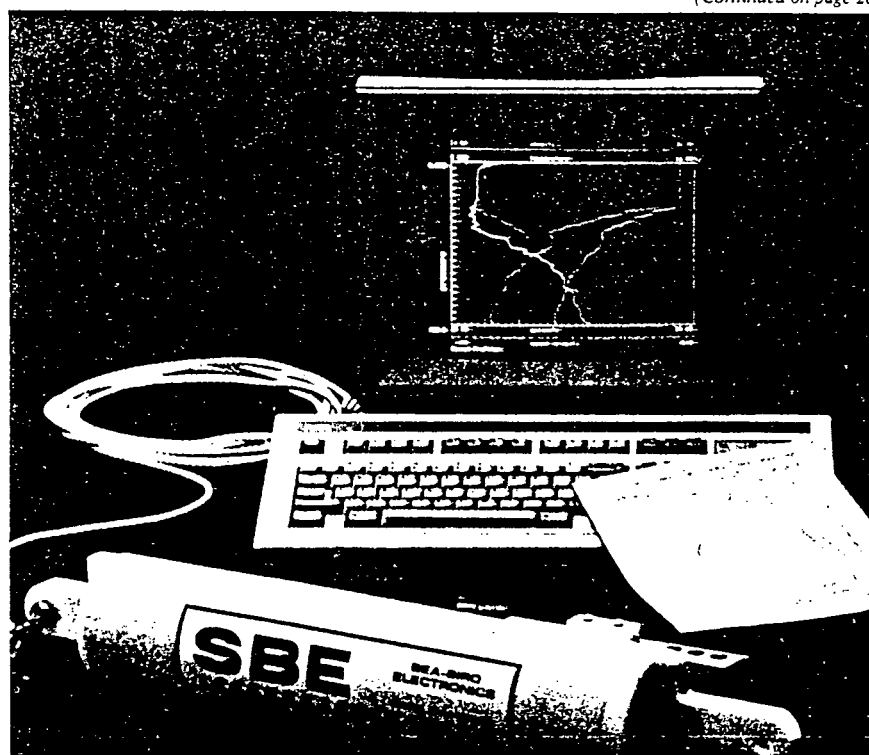
- Development path featuring a graded investment startup
- Backup by favorable policy and

socio-political environment

- Meets environmental protection issues
- Takes short and long range economic and market conditions into account
- Does not require development of basic scientific understanding, i.e., is a technology development
- Scaling models exist for transition from laboratory to industrial practice
- Spinoff developments are inherent in the approach.

These fundamental traits allow the development of a business plan which permits the highest technological risk

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problems to be solved with a modest initial investment. Operations and market testing would be conducted under a prototype operation which again does not require a full scale manufacturing investment. It is also important to identify multiple potential paths for market development so that more than one option for investment payback exists.

In conjunction with those new incentives and special projects which could be directly encouraged by federal government actions, a movement to organize those states having direct or strong indirect interests in ocean development as well as currently established ocean business would be helpful in establishing a strong constituency for the oceans. The development of such a coalition in formal recognition of the increasing importance of the oceans as a major factor in state and local economic structure would provide a strong and effective boost to the Ocean Enterprise Concept.

Implementation Strategies

The overall program for the Ocean Enterprise Concept should, of course, embody much more than such major new thrusts as are discussed in the preceding sections. Implementation of the concept ought to establish a total environment for the enhancement of ocean related activities and interests of all types. The principal measure of the long range effectiveness of the program will be the initiation of major new development areas that can sustain growth. Without the implementation of the total Ocean Enterprise Concept, the "new approach" initiatives as are discussed in the previous section would have little chance of successfully developing.

The foregoing arguments suggest that the basic operating approach for the program must be that of a team effort, with coordination by key federal agencies backed by specific White House approval, supporting major activities in five areas:

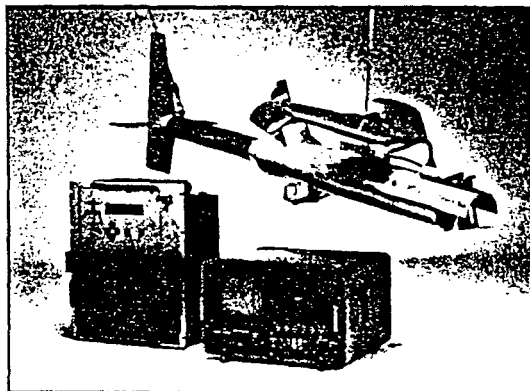
- Policy development
- Awareness enhancement
- Constituency establishment
- Research and development direction and augmentation
- Development of ocean enterprise projects.

Participation by the White House (particularly the Office of Science & Technology Policy) and other departments and agencies would be most important. Especially beneficial would be a presidential memorandum or statement ushering in the program and designating federal agency responsibilities.

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