

Ocean Engineering in the Decade Ahead

AS we stand at the outset of this new decade, it is of interest to consider what broad courses of action might be supported to advance our skills as a nation in dealing with ocean engineering problems.

Certainly there have been notable accomplishments in the Sixties. From the fervent biddings of President John F. Kennedy in 1960, many organizations, dominantly industrial, have devised and developed deepdiving craft, oil and gas drilling and recovery systems, bottom survey techniques and have, through governmental programs, significantly extended the depths to which man can live and work in the seas. Toward the end of the Sixties, there has been a slowing of many of these activities, largely because of the tightening of both governmental and corporate funding. Extensions in these areas will be expected to take place in the Seventies. What can be done in a practical way to hasten the advance in these many endeavors to improve man's capabilities to exploit rationally the wealths held in the near and not-so-near shore areas of the ocean fastnesses?

It would seem that there is a need for a coordinated effort to obtain technological advances in the design of all manner of floating and fixed structures and in the design of programs to attack effectively the problems posed by pollution of various kinds. The cry is heard that a "Wet NASA" is needed. I, for one, would much rather see a "Wet NACA," which means a fact and data (to be redundant!) producing laboratory covering all the "waterfronts" of ocean engineering. Yet one wonders in the face of the record of performance of most government-controlled laboratories and service groups that it is any longer possible to achieve the hard-hitting qualities which made possible the broad and detailed advances of the old NACA and, in more recent years, the Navy's Special Projects achievements in the development of the FBM submarine.

We are caught up in the mode of systems approach which first means that all manner of things must be studied broadly for a few years in the abject fear of not following the optimal path. My small observation is that this often appears to postpone the achievement of anything. Certainly the many conflicting requirements of new structures and processes demands the recognition of couplings—but, basically, only those of significance. The first business is to identify the central problems and then, within those, to get to work to obtain the relevant facts which must first be uncovered before the trade-off problems can be resolved. Broadly based techniques are fine, but they cannot function without getting

to the nitty-gritty mechanics of the phenomena involved, be they sea-induced forces, corrosion processes, or effective country-wide legislation to control the effluents polluting our lakes and shores.

We, as a nation, have many "natural" resources in the form of governmental, industrial, and university-operated groups capable of doing the research and development sorely needed to provide the essential elements for evolving the functional systems to effect retrieval of vital resources and to cleanse the waters. What is needed is a federation of these talents coordinated by a small, but highly motivated group, managed by forward looking, yet pragmatic, engineers to spend government funds effectively.

All these are pious thoughts which are easily deduced. How to achieve this "optimal" engineering management which marshalls the country's talents on these ocean sub-problems? Perhaps the answer is to start small on a single, large problem with hand-picked people, to direct a concentrated effort. Then, when this managerial effort becomes over-critical in size, shake it down to keep it lean and hard-hitting—not allow it to be self-propagating.

Recently there is evidence of something like this concept being developed in the Maritime Administration in a fourth-quarter effort to turn around the downward plunge of the U. S. Merchant Marine. Plans have been evolved to weld a new "community" combine of government, industry, and academic talents to find ways to make U. S. ships much more competitive. It is anything but an easy task. But this country was built on initiative and pragmatic team effort. Let us hope that this renewed effort in the oldest quarter of ocean engineering can point the way by which the more youthful aspects of this field can make rapid advancements in this brand new decade.

Among the important problems passing into this decade which may be mentioned are those associated with the survivability of drilling platforms in severe sea states. The tendency developed lately is to move to greater depths which enhances enormously the motion and position-control problems. Current support of this seakeeping problem is minimal, and each configuration is currently studied individually by industry. Development of modern, much more efficient fishing vessel and processing systems is in need of a strong push. Examinations of procedures for containment of oil leaks and spillages are just beginning. Means for developing a practical network of ocean buoys for monitoring of ocean and meteorological conditions are

only recently being explored. The design of "ice-faring" tankers is most certainly in its infancy.

All these problem areas (and many others) require intelligent management and the application of laboratories which can respond to the needs of governmental agencies and industrial groups. Unfortunately, relatively few laboratories are capable of providing timely, incisive answers. Where large facilities exist, the pace is sluggish. Smaller activities, where quick response is possible, are severely hampered by facility limitations. Such limitations are the result of long-standing decisions by many government agencies to provide facilities only at government-operated installations. This attitude has led to the appearance of some new, research-oriented firms who, largely through their own efforts, have built laboratories. Although this is all to the good, it often does not provide the means by which proprietary rights can be respected during evolution of a development by private corporations. A partial answer

to this inadequacy of funding of test equipment and research at universities is being provided by the National Sea Grant College Program. Current budgetary limitations really preclude the major innovations which are necessary to make many college-supported institutes competitive—even with European counterparts. It is hoped that this program will flourish more fully in the 70's and that the results will be found useful by industry and government.

The Editorial Staff of this publication wishes to take this opportunity to thank most heartily the authors and the reviewers for their wonderful first and second efforts in making it possible to bring you, our readers, a Journal worthy of the needs of this emerging field during the past year.

J. P. Breslin
Editor-in-Chief

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