

## II. Summary of Findings

OTA analyzed the National Science Foundation's plans for its ocean margin drilling program. These plans are not yet complete, but they have resulted from a substantial effort over the past several years by government, industry and academia to develop a major, important new thrust in earth and ocean sciences. The OTA findings are based on a relatively brief review of these plans, and rely heavily upon the advice of scientific and industry specialists having considerable experience in the field.

The following are principal findings derived from our review.

1. The NSF plan for ocean margin drilling developed in March 1980 contains many worthwhile scientific objectives; the drilling plan and sites chosen encompass significant scientific investigations and are in keeping with past committees' recommendations. It is a distinct improvement over previous ocean margin drilling plans. The plan is, however, a considered compromise which was developed considering such constraints as the use of an Explorer-type vessel and drilling only in water deeper than 6,000 feet. While most scientists agree that the compromise is a reasonable one given the constraints, many question the wisdom of the constraints.

2. The ocean margin drilling plan is supported by NSF and the Joint Oceanographic Institutions (JOI) who assisted in its development. However, there is not a broad scientific consensus on the present program. Since it has been less than three months since the March 1980 NSF plan was prepared,

neither a detailed document nor a peer review process has been developed. A more explicitly defined and executed peer review process in the future would help to build a consensus. Holes, sites and objectives are likely to change as the technology and other plans are developed in the future, and additional scientific review will be necessary to assure broad support and proper attention to high priority scientific problems.

3. A major concern of many scientists is the lack of specific plans for geophysical investigations that must precede the drilling. However, a planning effort did begin after the March 1980 meeting.

4. The probability of achieving the scientific objectives through the holes drilled and information collected will, in large part, be determined by the capabilities of the technology developed. The technology for controlled drilling 20,000 feet beneath the ocean bottom in about 13,000 feet of water is not yet developed. Some of the deep holes may not be completed as planned because of the technological uncertainty associated with deep ocean drilling in as yet unknown environments. Engineers and scientists will undoubtedly need to make compromises as the program proceeds which may result in either lowering of the ultimate scientific objectives or significant cost escalations. Both academic and industrial scientists are concerned that additional costs to develop deep drilling technology could be diverted from other science funds which are not yet fully defined or from other NSF ocean science programs.

5. The potential for oil and gas resources in the continental margins is a subject of much speculation, but competent geologists claim

that these areas hold significant promise at least to the extent that they should be carefully explored. The ocean margin drilling program would provide better scientific information on which to base further speculation on oil and gas resources, but it is not a logical oil and gas exploration program. Some petroleum companies have claimed that they are not participating because the program is not adequately directed toward assessing commercial resources. Others claim they expect the scientific benefits to help them in the long run.

6. The National Science Foundation has successfully directed the deep sea drilling project over the past ten years, however, NSF has used an established oceanographic institution to carry out the day-to-day management. The ocean margin drilling program represents a major increase in money and a new thrust in technology development, not a simple expansion of previous efforts. The capability and appropriateness of NSF in managing such a program has been questioned by some scientists and engineers. Their questions include: whether NSF can effectively manage the considerable technology development work; whether the oil and gas resource aspects would dictate more direct involvement by DOE or **USGS**; whether the science benefits are overshadowed by the technology development benefits and whether the relative contribution of each participant is equitable.

7. The petroleum company participants are expected to decide this July whether to support the first year's efforts. Most of these participants support the program because they believe it will result in progress in science and have some secondary benefit to their interest in

subsea hydrocarbon resources. Many companies are concerned about their liability as participants in the program, about anti-trust problems that may develop and about the level of funding required by each. They believe that more companies need to be involved if they are to support the effort past the first year. Some believe the cost estimates are too low for the technology now planned.

8. A more sharply focused science program with fewer options than the present plan is advocated by several of the scientists OTA contacted. They have suggested alternatives which might result in lower initial costs and a postponement of the decision to fund major technology developments. Many of these alternatives include an approach to first identify those drilling targets which are within present technical capabilities. Other alternatives could be developed with a greater emphasis on hydrocarbon resources (and thus industry involvement) but would probably require considerable changes in government practices in leasing offshore lands for oil and gas exploration (see Section IV and Appendix A and C).