

VII. Program Management Considerations

The National Science Foundation has successfully directed the deep sea drilling program over the past 10 years using oceanographic institutions to manage the scientific effort. The ocean margin drilling program is a major increase in money and complexity from previous efforts and thus the capability and appropriateness of NSF to manage it is subject to question. Several problems have been noted and should be considered. These include: whether NSF can effectively manage the considerable technology development work, whether extra funds that could be needed for technology would be taken from other programs, whether the possibility of finding oil and gas resources should bring DOE or USGS into more direct involvement, and whether the science is overshadowed by the technology.

The ocean margin drilling program is similar to the deep sea drilling project and other programs NSF has directed. Similarities include operating a drill ship, a drilling operation, site selection, and site surveys. Management experience gained from earlier projects will be particularly helpful in developing a management structure at NSF for the ocean margin drilling program.

The proposed management structure for the program relies on the current staff for the deep sea drilling project, a systems support contractor, science support contracts with JOI Inc. , and a future systems integration contractor. As in the deep sea drilling project, JOI Inc. is scheduled to organize a number of panels, which will provide the scientific direction for the program. The systems integration contractor, who will be responsible for system design, construction, and operation, will be selected after the

program has been specified in sufficient detail to prepare formal invitations to bid.

In addition to the basic program management, NSF plans to establish outside groups to advise both the director and the ocean drilling program team. A program advisory committee will comprise 40 percent industry representatives, 40 percent from academia, and 20 percent from the public sector. The Marine Board of the National Research Council has already selected a smaller advisory group from among those who served on their 1978-1979 committee. The Navy is to be called upon for its expertise in ship conversion inspection and supervision. Additional consultants from government and industry will be used as required to assist various facets of the program as it develops.

In managing the program, the three major aspects are operational scientific, and technology development. Scientists are concerned because of the current emphasis on the operational and technology development aspects. The plan developed in March 1980 has not yet won wide support from the basic research community. This may be because there has not been enough time for everyone to become familiar with it. Or it may result from the fact that earlier expectations can not be met within the financial, time, and engineering constraints faced by the project. A more detailed, overall management plan for science, such as spelling out the responsibilities and authority of NSF, industry, JOI, Inc., and the panels, may answer some concerns.

Since the 1977 FUSOD meeting in Woods Hole, planners and participating scientists have stressed the need for extensive geological and geophysical

studies as a prerequisite to site selection and drilling. This is called problem definition and goes beyond the specific site surveys that will be needed before drilling begins. The fact that tentative sites were identified at Houston in March 1980 does not negate the need for problem definition.

For example, OTA'S panel suggested that the tentative drilling site on the eastern U.S. continental margin may not be the best place to drill to obtain maximum scientific advances. Several years of intense geological and geophysical research are still required before the regional setting for the drill site will be adequately understood. The planning process for this effort has just begun.

The funds identified for science in the Houston plan are listed under "scientific program (survey)." We must assume that these funds are not only for site surveys but also are for problem definition, scientific participation in the drilling phase, interpretation of logging, etc. If SO, it would be reassuring to the scientific community to have a detailed breakdown and plans for use. Another point that needs to be addressed in science funding is the program for the routine analysis and scientific studies of core samples once they are in core laboratories. No allowance was made for this research in the deepsea drilling program. Careful consideration should be given to this issue now.

The **site** surveys will require equipment that is not now available on academic research vessels, like narrow beam echo sounding. Many institutions are planning to use academic research ships for site surveys. If that is the case, the NSF Office for Oceanographic Facilities and

Support and university ships coordinating groups should be brought into the planning at the earliest possible stage. Another possibility, however, is to charter ships from industry. This may appear more cost effective, but its impact on the academic fleet could be severe.

The possibility that operational funds will have higher priority than scientific funds during the program concerns many scientists. Some means is required for assuring that funds for science will be protected against the overwhelming demands of logistics and operations. Although some safeguards are built into the ocean margin drilling program, such as industry agreement to share overruns and funds from international participation, more adequate arrangements are needed. NSF could consider assigning administration of science dollars to one of the other divisions. Both earth sciences and ocean science would be suitable. Adoption of this procedure would assure strong guardianship of the science funds as well as good scientific overview and administration within NSF without having to hire additional science administrators.

Another major concern of scientists is that, because of the very large budget for ocean margin drilling, the budgets for all other earth and ocean sciences programs within NSF will suffer. This is a real possibility despite the fact that the ocean margin drilling budget is an add-on to NSF's present budget and the petroleum companies are providing half the funds.

Unforeseen cost increases in later years will probably affect the internal budgeting of NSF's earth and ocean sciences rather than any other part of the Foundation. NSF will need to make a special effort to avoid such a negative impact on the other earth and ocean science programs. And

Congress may wish to keep this problem in mind in its annual review of the NSF budget.

Also, because of its size and the involvement of such a large segment of the geology and geophysics community, the ocean margin drilling program might skew the field sufficiently that it would impede progress in other areas of geology and geophysics. In a similar vein, ocean margin drilling might skew NSF's science management at the administration and division levels to the point where other earth and oceans programs might be neglected.

NSF is currently preparing an environmental impact assessment of its program, including possible impacts of riser and riserless drilling. The importance of science and resource evaluation are the rationale cited for performing the program. The assessment covers alternatives to the program ranging from abandoning it because the anticipated impacts are too severe, to limiting the drilling depth.

Because the program's impacts on the "oceans" cannot be determined, a generic statement will be issued and yearly environmental impact statements will be released after each new site is chosen. The supplemental statement will be based on geophysical surveys and samplings performed at each drill site. Impacts or possible environmental consequences of the program that have been identified and will be studied include possible changes in air and water quality, disposal of cuttings, and possible oil and gas "accidents."

Other government agencies, including USGS and the Coast Guard, and environmental groups have been contacted and their suggestions incorporated into the assessments.

Regarding the appropriateness of NSF to manage the ocean margin drilling program, several factors suggest that it should be the lead agency.

These are:

- o Efficient and successful experience with the scientific, engineering and operational aspects of the deep sea drilling project and the Glomar Challenger.
- o **Basic research aspects of ocean margin drilling dovetail with NSF'S mission and will benefit from its other scientific programs.**
- 0 The basic research orientation of the program will probably continue to be emphasized.
- 0 NSF has the respect of scientists and other government agencies for handling basic research. It may be the only agency acceptable to all parties for handling this kind of program.
- 0 **NSF' may be the most stable agency, with regard to its mission and orientation, for the life of the program.**
- 0 **Ocean margin drilling would be a major program of NSF and would have the continued attention of the agency.**

There are also several factors that suggest another agency lead and or support from other agencies like DOE or USGS. These are:

- o The National Science Board appears to have a slight bias against big science. The administration is more comfortable with small science programs.
- o NSF has had little experience with joint industry-academic programs.
- o NSF is still a relatively small agency and may get caught in a squeeze between industry, the Department of Energy, and the Department of the Interior.
- o If the program objectives change from basic research, NSF may not be the appropriate agency.
- o The large amount of technology development in the program may be difficult for NSF to manage.
- o Assessing resources is not part of the NSF charter.

In conclusion, the details of the overall management plan for science, like the responsibilities and authorities of NSF, industry, JOI Inc. and the panels, are not yet well spelled out. Furthermore, neither the new ocean margin drilling division nor the JOI Inc. staff yet appear to have sufficient scientific or technical strength for proper management of the scientific aspects of ocean margin drilling.