VI. Industry Participation in the Program

The potential of oil and gas resources in the continental margins is subject to 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 help establish better scientific information on which to base further speculation on hydrocarbon resources, but as designed it falls far short of a logical program to explore for oil and gas. Some petroleum companies claim that they are not participating because it is not directed more toward assessing commercial resources. Others claim that they are participating because they expect the scientific benefits to help them in the long run. The U.S. Geological Survey expects to benefit in their efforts to evaluate long range oil and gas potential in offshore regions.

Eight petroleum company participants will decide whether they will help fund first year efforts in July 1980. Most of these participants are supporting the program because they believe it will produce valuable basic science and have some secondary benefit to their interest in possible future oil and gas resources in the ocean.

OTA contacted representatives of the petroleum company participants and some additional companies who declined to participate in the NSF program. In these discussions, many companies expressed their concern about their liability as participants in the program if they have no management control over the operations. Several companies are also concerned about the level of funding required by each and believe that more companies need to be involved to assure the program's future viability.

While technology for very deep drilling is considered by all of the petroleum company participants to need significant development, some are concerned that either the cost estimates are too low or that the chances of reaching all the deep holes are not good. It appears, in general, that industry participants will force future decisions on realistic technology development goals and cost estimates.

Industry support for the ocean margin drilling program is tempered by the above factors. One reason for this is that only 5 of a hoped for 20 companies are actively participating as of May 1980. NSF hopes that a total of 8 will be participating by July. This does not place a severe financial burden on those companies during the first year. Many feel, however, that greater participation is needed in subsequent years when a much higher level of funding is necessary.

Closely connected with some apprehension by industry participants is the manner in which most companies evaluate the benefits of the program. In general, the funds which each of the companies would commit are not "new" funds but would be reprogrammed from present industry research and development budgets. Thus, some are concerned about giving up some company research and exploration in exchange for participation in the NSF program. Some non-participating companies are keeping close watch over the program and, if the program benefits change, they may decide to join.

Benefits to Industry

The companies that OTA surveyed expressed a variety of reasons for participating. Some that do not have extensive technology development

programs themselves, felt that will be the principal benefit. Riser technology and well control were two specific areas mentioned. None of the companies felt that information on potential commercial resources would be a great benefit.

However, some foresaw benefits related to the science of sedimentary geology. Very few felt that there were specific, substantial benefits to industry. However, they felt that there would be long term intangible benefits, similar to those from the deep sea drilling program, and from new ideas that are derived from the results.

Perceptions of Industry as to the Science and Technology Quality of the Program

With respect to industry views on the scientific merits of NSF's ocean margin drilling program, several industrial members stated: 1) it will fill gaps in knowledge, 2) good scientific talent is on it and thus the program must be good, and 3) it will result in a scientific enrichment similar to that achieved earlier by the deep sea drilling program.

Other industry views in questioning the program include:

1) **"Too little attention is being given to initial survey work and to reflection seismology."**

2) **"It is good science, but whether it is an effective use of the money to get the information is debatable."**

3) "The science is being developed backwards. the scientists are narrowing themselves down to one option too soon. They need to develop better regional data."

4) "The program is unfocused and has too much of the attitude of let's drill and see what we find out; the deep sea drilling program was much better focused on specific scientific questions."

Several industry participants expect the program to advance riser technology, well control, and metallurgy. They feel they have the technology in hand to drill in 6,000 feet of water and that the capability increases at about 600 feet per year. This program could provide technology to drill in 13,000 feet of water, which oil and gas companies would not otherwise pursue in the near future. Also, industry involvement is considered important for advancing the technology in this program.

Increase in Resource Potential Knowledge

Most industry participants agree that the program will not generate significant assessment of commercial resources, but only bits of boundary information from which some inferences might be drawn.

Other comments from industry included:

1) "Resource knowledge would be gained in an indirect way. New ideas may be generated with respect to source rocks or settings that might be conducive to production. However, the program

would not provide the information necessary to define any reservoir."

2) **"The program can result in a better geological picture of sediments and thus aid in the analysis of basins."**

3) "We expect to gain knowledge concerning sediments in the areas being studied and will be able to draw some conclusions regarding specific areas of opportunity."

4) **"As for improving the knowledge of oil reserves, the ocean margin drilling program would not be the way to go about it."**

Additionally, several petroleum companies are concerned that government leasing decisions might be made as a result of the small amount of information gained in the ocean margin drilling program. However, a much larger data base would be desirable than will result from this program.

Problems Identified by Industry

Industry participants believe that program costs may escalate due to unrealistic goals set by some scientists. They think that compromises will be necessary between science and technology in the future, particularly with regard to very deep riser drilling.

To satisfy scientific goals, there will be difficulties in developing satisfactory instrumentation for well logging, according to some industry representatives. Also, the drilling system will have to address some major problems, including riser development and the adequacy of metallurgical materials used to drill where high temperatures will be encountered.

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There is also concern as to the adequacy of the technology for controlling wells and the on-site management of drilling operations. Drilling at sites where there is no backup to kill a blowout is particularly disconcerting. If the Glomar Explorer is the only ship capable of deep water drilling with a riser and a blowout preventing system, no other vessel could be engaged to kill a blowout if one occurred.

Some participating companies question their liability in case of a blowout. Parallel to that is a concern about antitrust considerations. Presumably, geological data and information on new technology will be published. Non-participants might ask whether it is published in a timely fashion with respect to any leasing on adjacent tracts.

The resolution of these various problems will be required for industrial participation in the drilling program as will the determination of technical feasibility and accurate cost estimates.

Alternative Suggestions

Some industry representatives surveyed by OTA suggested alternative approaches to the program. In general, these emphasized the need for academic scientists to undertake a large seismic program prior to defining a drilling program and then to consider alternatives such as using available drill ships instead of refitting the Glomar Explorer for drilling the holes in shallower water depths. One specific suggestion for the technology development was to outfit the Glomar Explorer only for setting deep risers and not convert it to a drilling ship. It could then be possible to use any

of a number of available commercial platforms for the drilling operation.

Some other alternatives suggested were:

1. Undertake the research in conjunction with industry's normal progression of technological development using available ships as required. A large part of the slopes can be evaluated with present riser technology. Conduct the deeper drilling later.

20 Keep the Glomar Challenger program active for several more years. There are significant benefits to be derived from additional holes along the edges of the sediment slopes.

3. Provide academic scientists with advanced geophysical equipment (arrays and processes) and a ship for work in research related to sediment stratigraphy and crustal formations. Undertake a significant seismology program before undertaking the ocean margin drilling program.

4. Undertake a drilling program on the continental slopes of North America using available technology and, simultaneously, undertake a worldwide, multi-phase seismic survey. Follow this with a deep drilling program in prospective areas defined by the seismic surveys.

One industry scientist asked whether it is actually necessary to go to a 13,000-foot water depth to gain the required scientific information. He also asked whether sites around the world could be found at lesser depths that would still represent critical geological formations of interest.

Industry recognizes that geophysical seismic reflection work has to be followed up by drilling, which is the only way to gain some of the most significant information. However, some industry members said that NSF's program did not reflect the need of scientists to review priorities in margin geology during its first year.

Program Costs

Industry's view of the accuracy of projected costs varies. Some feel that the costs allocated for ship modifications are low and that it would be less costly to build a different ship. Others say that until the first phase studies are over, it is not possible to project costs with any accuracy. Still others conclude that they are getting good estimates. Since the costs are based on specific holes and drilling time allowed (not required) they are probably about right.

Cost estimates are an important output of the program's first phase and will be of extreme importance to both government and industry.

Funding Reduction with Program Extension

In general, most of the industrial participants feel that a funding reduction and program time extension would be beneficial and probably more realistic. Some believe that the technology will take longer to develop than scheduled. From a scientific point of view, some felt that extending the program by delaying the drilling phase would result in a better definition of both the program and the modifications required to the Glomar Explorer. It could also allow NSF to select another drill ship.

One industry scientist particularly felt that reduced funding and a stretched out program would be excellent in that it would enable a proper program progression. Academic scientists could gain greater capability through acquiring advanced seismological equipment, could conduct the necessary reflection seismology, and thus could make a more judicious selection of the sites to be drilled (the main program cost).