



PD-AAS-229

IN 42309

Center for Strategic & International Studies
Georgetown University • Washington DC

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MOROCCAN CONVENTIONAL ENERGY PROJECT

Evaluation Report on Moroccan Segment of Conventional Energy
Technical Assistance Project (936-5724)

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September 30, 1985

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NATURE OF THIS INTERIM EVALUATION REPORT

This is a final report on the Moroccan Conventional Energy Project (936-5724) in support of the parastatal petroleum organization, ONAREP, in its exploration and development of Moroccan gas reserves. This report comprises part of an overall final report on the Conventional Energy project, including Pakistan, the Philippines, and Costa Rica.

GOAL OF THE CONVENTIONAL ENERGY EVALUATION REPORT

This Conventional Energy Evaluation is carried out under contract LAC-0000-C-00-4085-00 between AID and Georgetown University. It is designed as an evaluation of the existing CONVENTIONAL ENERGY TECHNICAL ASSISTANCE PROJECT (936-5724) of AID S&T/EY, including how it was developed and managed and what lessons were learned to apply to future project implementation.

First, a capsule project history is given and then the procedures carried out by the investigating team are outlined. Following that, in line with the statement of work, the project rationale and procurement are investigated, project redirections and impacts are evaluated, and generic lessons are drawn for future conventional energy projects.

CAPSULE PROJECT HISTORY

The project supplied technical assistance to the parastatal organization of the government of Morocco, ONAREP (Office

National de Recherches et d'Exploitations Pétrolières), to help it develop petroleum and gas resources, especially in the Meskala basin. A memorandum of understanding was signed between the government of Morocco and the United States in May 1982, and a work plan was developed in August 1982 for the contractor, Bechtel (already under a general contract with AID since September 1981). The project commenced in September 1982. In May 1983, as a prerequisite to the Mission taking over the program, an independent evaluation team looked at the project which led over time to the Mission taking over the program, a decision compatible with S&T/EY policy. Since some delay in obtaining the new procurement made with ESF funds was foreseen, in July 1983 an agreement was made for temporary S&T/EY funded assistance using the team already in place in Rabat to make a "bridge" between this project when it expired, and the new program. The Mission program took over in the fall of 1984.

METHODOLOGY OF THE INVESTIGATING TEAM

A two-man investigating team, consisting of William Ramsay and Richard Kessler of the Center for Strategic and International Studies of Georgetown University, carried out the evaluation by examining project documents and through on-site interviews with AID staff, other agencies, Moroccan government officials, consultants, and members of the business community.

Documents reviewed included AID project papers, correspondence, an independent evaluation carried out by a team of consultants in May 1983, various AID memos, World Bank planning documents and memos, documents from Moroccan sources,

and contractor reports on the project.

AID personnel in Washington interviewed included Charles Bliss, Alan Jacobs, Pamela Baldwin, and Carolyn Coleman. Staff interviewed in AID/Rabat included Robert Chase, Gary Bricker, and Dianne Tsitsos. James Bever, now with AID/Pakistan, was interviewed. Richard Johnson, Second Secretary for Economic and Commercial Affairs at the U.S. Embassy was also interviewed.

At ONAREP, respondents included Said Hajji, (Chief of the Division of Administrative Affairs), M'Barek Ali Mouhsine, (Manager of the Petroleum Participation Division), A. Debbagh Mounir, (Chief of the Division of Studies and Planning), Mohamed Bennis (Chief Engineer of the Division of Development and Production), Khalid Oudghiri (Chief of the Department of Development and Exploitation), Ali Harraj (Chief of the Production Department), and Almoundir Morabet (Adjunct Director of Exploration). Others interviewed were Ilham Zurayk of the World Bank, Pier Luigi Vigano of Amoco, and H.C. Hays of Mobil Exploration Morocco, Inc.

Contractor personnel interviewed included James Houle (Bechtel), James R. Schyberg (Bechtel), Phiroze J. Nagarvala (Bechtel) in San Francisco and members of the in-country team, Dan Sullivan (formerly of Woodward/Clyde, now with Williams Charles Druitt. Also interviewed was Michael Scarlatos of Development Sciences, Inc.

PROJECT EVALUATION

This evaluation is organized into three sections on

(1) project rationale and procurement, (2) project realization (redirection and impacts), and (3) generic lessons.

1. Project Rationale and Procurement

In this section, the processes of (a) country selection, (b) project selection, (c) relation to S&T/EY goals and (d) procurement procedures are investigated.

a. Selection of the Country

Morocco was evidently selected because it badly needed domestic sources of energy* and had the administrative capability of taking major steps to help it itself in the development process.

Less direct reasons for the choice appeared to stem from the fact that Morocco already had several energy projects with AID, that the energy sector might yield the quickest results (faster than long-term agricultural schemes, for example), and that energy sector activities could serve as a backup to AID agricultural initiatives and presumably to its other priority areas (population and private sector development). In addition, one document expressed the idea that an energy project might (presumably because of its strategic dimension in world oil geopolitics) be especially compatible with the proposed introduction of ESF assistance into the Morocco AID program.

* Domestic energy production equals only 10% of commercial energy consumption. Petroleum imports are 39% of exports and 27% of imports. The oil import bill rose in the first half of 1984 by 16% due to devaluation of the dirham. Power outages are now occurring, mainly because of a 80% drop in hydroelectric generation. The energy resource base is relatively unknown. Oil shale and uranium supplies are available but entail substantial cost and risk. The reserves of the country's only coal are quickly being depleted.

(The table shows a recent list of AID/Rabat energy activities: note that the Mission's conventional Energy Management and Training project shown there is the follow-on to project being evaluated here).

b. The Selection of the Project

The first activities related to the project were AID discussions in 1978 on possibilities for assistance to Morocco on a number of renewable energy projects. Further discussions with the Moroccan Ministry of Energy and Mines (MEM) were held during October 3-10, 1980, at a joint Oil Shale Colloquium. At that time, AID and MEM established three areas for possible cooperation:

- 1) the development of a program for oil shale exploitation;
- 2) work with MEM's energy renewable cadres to develop the linkage between conventional and renewable energy; e.g. increasing technical information from CDER, and
- 3) investigating oil exploration strategies of MEM, working in cooperation with the World Bank.

From the start, the approach to establishing cooperation with MEM focused on the use of technical assistance cadres. Analysts were to evaluate MEM, determining its needs and setting priorities. The duration of their evaluation was foreseen as lasting at most a few months. The original objective was to concentrate on maximizing assistance in oil shale development.

In January 1981 Charles Bliss and Alan Jacobs of S&T/ZY visited Morocco to discuss with the mission what energy assistance AID could provide in a number of areas. Oil shale

exploration was one subject investigated. It was foreseen that a 8-man staff with other consultants would be needed for 60-66 man months beginning in April 1981 with a staff in place by May. In fact, a contract with a reduced staff was not signed with Bechtel until September. This delay significantly reduced the Office of Energy's ability to begin large-scale technical assistance efforts.

Originally, AID was to assist MEM with an oil shale mining study, fielding a resident shale oil adviser. The project design was radically changed, however, as a result of natural gas discoveries financed by a World Bank loan near Essaouira, yielding 172,000 cubic meters per day with 510 barrels/day of condensate. Encouraging signs of conventional energy potential led the Moroccan Minister of Energy to visit Washington in November 1981, not to promote oil shale, but to solicit US support for the new petroleum parastatal, ONAREP, which was to be established in January 1982.

In February 1982, Charles Bliss and Pamela Baldwin (AID/Washington), Raymond Fary (U.S. Geological Survey), Morton Gorden (Development Sciences) and James Houle (Bechtel) visited Morocco to discuss US technical collaboration for developing Morocco's energy resources. AID staff were still expressing interest in oil shale program activities. The MEM staff, however, instead focused attention on AID support for ONAREP, claiming a lack of interest in oil shale project because of the "prospect of jeopardizing the success of current loan negotiations [with the World Bank] if procedures diverged from [World Bank] practices." In November 1981, during a visit to

Washington by the Moroccan Minister of Energy and Mines, technical specialists were requested to help ONAREP in its gas activities.

This proposed redirection was in fact strongly influenced by radical changes in the oil shale outlook. Initially, the GOM appears to have been using AID's interest in oil shale as a way for bargaining for increased World Bank activity in this area. The Bank had been hesitant about loaning Morocco money for oil shale, attaching conditions that in fact ultimately led the Moroccan Prime Minister to reject the \$15-20 million loan. The natural gas discovery thus provided a welcome opportunity for GOM to shift AID's focus to a new energy lending area.

AID proved receptive to this new approach. A project to aid a state entity like ONAREP develop gas was held to be necessary because international oil companies have little interest in developing relatively small natural gas fields for domestic consumption. AID involvement was also justified both on the basis of established American technical expertise and on the GOM's interest in diversifying its donor base. Quoting the Minister of Energy and Mines, one AID/Rabat official wrote that they wanted US support because it was "scientifically credible and objective" to "balance out the more self-serving Western European analysis or the out-dated Eastern European techniques."

In March 1982, a Memorandum of Understanding was drafted which was signed in May between the A.I.D. Mission to Morocco and the Government of Morocco. The memorandum called for service to be provided by Bechtel. Bechtel was to transfer technical

expertise and management capabilities to the Moroccans through consultant-counterpart relationships. In August a five-man team was posted to the field, beginning work September 4th.

The key rationale for the project may be reflected in a cable from AID/Rabat on February 1983:

It is in U.S. interest to maintain a strategic toe-hold in this important area, especially since it could provide a point of leverage for dialogue in key issues such as pricing-policy and future role of private sector, including U.S. trade/investment:

c. Relationship to S&T/EY Program Goals

If S&T/EY program goals are taken to center on the development of energy independence in developing countries through the replacement of imported oil, the program in Morocco is directly related to those goals. The technical aid given ONAREP would enable them to develop their gas reserves and to market gas (and any future oil production). Domestic gas could replace oil for process heat in the cement industry, for example, or in electricity generation, while oil finds would of course constitute a more direct replacement for imported crude oil products.

d. Mode of Procurement

The mode of procurement of the Morocco project was not properly speaking a mode specialized to that project, but part of an overall method of handling the Conventional Energy Technical Assistance project. Bechtel National INC was chosen as the primary contractor as the result of a competitive procurement in which twelve firms submitted proposals. The RFP was issued in July 1981, and the proposals evaluated by a panel in accordance

with evaluation criteria that were stated in the RFP. Bechtel Corporation was one of a few firms having a background in economic analysis and engineering that AID Washington judged suitable as primary contractors for the Conventional Energy Technical Assistance program. Against this background, Bechtel was chosen as the prime contractor for the Morocco project. A large proportion of the personnel used in the project, however, actually came through a subcontract given by Bechtel to Woodward-Clyde, a consulting firm having special expertise in petroleum-related matters. Even though the particular procurement procedure undertaking could be faulted, on balance, it certainly shows some strong advantages in avoiding paralyzing amounts of red tape in beginning to get the job done.

It is difficult to specify exactly how successful this procedure has been in the present case. Many respondents thought that the members of the Bechtel team had done a good job overall. Indeed, special efforts were made to hold over several of the Woodward-Clyde team through the "bridge" transition period between the expiration of the S&T/EY contract and the Mission contract. Nevertheless, it is relevant to note that, under the terms of an open bid process, the Bechtel Corporation was not successful in capturing the Mission-sponsored continuation work. Some respondents, indeed, seemed to believe that Bechtel was not as responsive as it might have been to concerns of the Moroccan government or of AID and that in some cases had assigned project personnel having inadequate knowledge of French, inappropriate expertise or lack of personal interaction skills. Some

respondents criticized overall project management deficiencies. Given the difficulties inherent in all such projects, Bechtel should probably be given an average grade on this assignment. Four parties were responsible for monitoring the project. They were the A.I.D. Mission in Rabat, the Office of Energy in Washington, D.C., the Bechtel team in the field under its team leader and the Bechtel project manager in San Francisco. The important linkage for monitoring would seem to have been between the Bechtel project manager in the field and the A.I.D. Mission. The Office of Energy from its distant viewpoint undertook to support the Mission whenever a problem arose that required solution. Nonetheless, it is legitimate to ask whether AID monitoring procedures were at fault in not succeeding in preventing or correcting deficiencies in Bechtel's assignments and decisions on a timely basis.

2. Project Realization: Redirection and Impacts

In this section, funding adequacy and modifications, task redirection and personnel problems, interagency interactions, and project impact on the host country are investigated.

a. Funding Adequacy and Modifications

Total funding for the project was \$2.877 million in AID funds plus \$0.959 million in Moroccan contributions (mainly in-kind). Some funding charges were made during the project life. When the Bechtel team first arrived in Morocco it had to renegotiate an increase in funding from ONAREP. S&T/EY thereby increased funding from \$1.2 million to \$1.7 million, with ONAREP increasing its share in services proportionately, providing for

language instruction and additional vehicles for the Bechtel team.* As the project developed, it became evident that allocations of funds had not been provided to cover all contingencies, that ONAREP was not in a position to provide the counterpart services it had committed itself to, and some considered that Bechtel's billing rates were high.

In regard to funding, the management of procuring equipment and incidental services posed a continual problem for the Bechtel team. Basic supplies had to be located and purchased often because ONAREP lacked these essentials or could not provide them in a timely manner. The contractors often found themselves providing the secretarial work which would normally have been expected by ONAREP. In addition, attempts to procure a small computer for use by ONAREP were later frustrated by a failure to comply with AID procurement regulations and a decline in funding at the end of the project. A lack of funds six months prior to the project's termination prevented ONAREP from querying Bechtel staff in San Francisco on a variety of technical issues useful to their work.

While fault could thus be found with the allocations of funds, it is not evident that any overall increase in funding could have greatly improved matters. In fact, it seems likely that this type of technical aid -- supplying experts to work with

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Some friction developed over the team's lifestyle. Moroccans resented providing scarce vehicles to the Americans and both the Moroccans and AID/Rabat believed that the team was housed in too-expensive accommodations, viewing this as a waste of their scarce resources.

counterparts both as on-the-job training and in a joint effort to get the work done -- may be characterized by certain built-in decreasing returns to scale on the amount of money that can be efficiently spent. That is, only so many people can probably be easily fitted into this kind of technical consultancy scheme at one time. Also, it is often difficult to get the quality and number of consultants needed for very large scale efforts. Furthermore, inadequacies in counterpart services are probably in general irremediable. Therefore, the overall funding level for the project may be judged to have been adequate.

b. Task Redirection and Personnel Problems

The project underwent several major changes in personnel and objectives. These changes appeared to be the result of several factors. First, was the natural desire by AID/Washington to initiate as rapidly as possible a project responsive to Moroccan needs. Secondly, GOM itself, as mentioned above, frequently changed its project objectives. Thirdly, the contractor's eagerness to field a team resulted in several personnel and

* Language was a generic "environmental" problem, for example, with uncertain impact on the final direction that the project took. ONAREP had initially stated that French-speaking advisers were not necessary but five months into the project said that they were. Several of the consultants claimed to have a "fair" speaking capability in French in their biographic statements but once in country this capability proved grossly inadequate. Only one member of the team spoke fluent French and he was later replaced for other reasons. The lack of trained French speakers meant that not only money had to be spent to train them, but also time. The problem was never fully resolved although both Moroccans and Americans appeared to have adapted to the limitation such that at the project's termination only a few

respondents mentioned it as a major problem.*

internal management problems that had to be corrected during the project's course. Lastly, the Moroccan working environment caused unforeseen problems.

Personnel changes were frequently mentioned by interviewees as the most prominent problems of the project. Clearly, much of the rationale for the changes in personnel resulted from a shift in ONAREP's objectives from oil shale to natural gas exploitation to promotion, and, most recently, to planning and technical studies. But some of the responsibilities lies with Bechtel's choice of individual team members and some apparently with communication failures within AID.

The initial Bechtel team and their assignments included:

- 1) Scott E.M. Hood: Oil and Gas Production Engineer
Production Division and
Chief of Mission
- 2) Bernard R. Soares: Chemical Engineer
Technical Coordination & Training
- 3) Gerald E. Voorhees: Petroleum Engineer & Geologist
Chief of Drilling Division
- 4) Dan A. Sullivan: Geologist
Regional Exploration Division
- 5) John A.C. Keefe: Geophysicist
Regional Exploration - Doukkala

The initial problem occurred between Hood and Soares. Soares was fluent in French and quickly assumed many of the team's housekeeping responsibilities, including liaison with AID/Rabat. In fact, not until several months into the project did AID/Rabat realize that Soares was not the Chief of Mission. Hood kept a low profile -- perhaps because of his lack of

language capability, but several Moroccans viewed him as basically in retirement, at the end of his productive career, and lacking ambition and energy. Others attributed his problems to culture shock. But the Bechtel team members evidently preferred Hood's quiet leadership to Soares' assertiveness, which caused considerable internal friction.

Soares also had the least well-defined occupation. His job was initially to serve as Bechtel's Technical Coordinator and work on issues of technical services and training, but as mentioned little was accomplished or foreseen in the training areas. In essence, Soares handled administrative issues for the team rather than providing substantive assistance to ONAREP. Soares's role also led to friction with AID/Rabat because he insisted that team members could not speak directly to the Mission without his approval. The problem was exacerbated by the fact that there was internal disagreement within the Office of Energy as to whether or not the Soares position was really needed in Morocco. After pressure from the Mission, Soares's position was eliminated in July 1983. This caused some initial difficulty for the team administratively, but it was corrected by the employment of a local hire at some savings of project funds.

A second problem related to Hood concerned his technical training. He had a well-defined specialization in coal slurry transportation. Initially, his experience would have been applicable to Morocco's shale development strategy but as this shifted to gas his background was less useful. Moroccans found that while Hood worked hard, he lacked the appropriate "profile" for a gas production expert -- a reason subsequently given for

the retention of Elf-Aquitaine as a contractor. The lack of an activity suitable for Hood's background resulted in his use by ONAREP in an area which raised policy problems with AID. ONAREP asked Hood in November 1982 to prepare the terms of reference for the design and construction of a natural gas pipeline from the Toukimt field to the Asmar cement plant at Msoudia 102 kilometers away. The project was later cancelled when the cement plant decided to convert from fuel oil to coal in part because ONAREP could not guarantee gas supplies. Hood became deeply involved in not only designing the pipeline, but also negotiating with the cement company and preparing offers for pipeline construction -- all without AID authorization. It was anticipated that Bechtel might ultimately bid on the project, and some AID thought Hood's activity inappropriate. Hood's unjustified expenditure of project funds for this pipeline study was detected by the Office of Energy but only after the funds had been spent. It is not clear why Hood's actions did not get him fired. Hood, however, remained with the project until August 1984, when his services were terminated early because the lack of oil and gas production no longer made them necessary.

A third personnel shift will be discussed more fully below, the transfer in December 1982 of exploration geologist Dan Sullivan to private sector promotion activities, in particular to help prepare briefings for major oil companies.

Another change occurred in June 1983 when the drilling engineer, Voorhees, resigned and Elf-Aquitaine was given the production subcontract on the Meskala field. Voorhees was

extremely experienced in his field and his specialization ideally suited for his assignment. Voorhees did not speak French, however, and on the drilling rig was forced to work with a number of relatively inexperienced Moroccans. His experience was also with international oil companies, which drill as efficiently and as effectively as possible. The Moroccans were not only inexperienced drillers, but also had a bureaucratic tradition that slowed the pace of work. In addition, Voorhees' Moroccan counterpart was believed later to have been involved in practices resulting in the diversion of vital supplies needed to drill. The lack of capabilities of the Moroccan counterparts coupled with the lack of skilled management resulted in several near disasters. It was reported by some respondents that Voorhees and quit in disgust at the pervasive atmosphere of inefficiency and corruption.

ONAREP then turned the field over to a French oil company, Elf-Aquitaine, rather than trying to develop their own expertise. As a national oil company in a period of slow world oil demand, Elf-Aquitaine had a number of surplus employees and the drilling, financed by the World Bank loan, was one way to provide for their employment. The Moroccans found most of these Elf-Aquitaine personnel to be second rate.

The second problem the Elf-Aquitaine contract posed to AID was that it resulted in USAID providing technical expertise to a French oil company. This might have caused a serious policy problem -- but in the event the well was found to be dry and the company's services were terminated.

A fifth personnel change occurred in January 1984 when

Keefe, the geophysicist, was promoted to Chief of the Exploration Division for the South West Sector. This, like the Sullivan shift (see below), was viewed as favorable by respondents. Keefe's work in Doukkala was considered excellent and his personality described as "dynamic." Keefe was later recruited directly by ONAREP after the project's termination. Keefe's success, primarily based on his capability and character, was undoubtedly aided by his association with a Moroccan trained in the U.S. who spoke fluent English, making communication less of a problem. Furthermore, unlike the drilling sector, respondents indicated that the exploration sector did not require a substantial French language capability.

Keefe's work was complemented in March 1984 by the sixth personnel change, the arrival of exploration geologist, Charles Druitt. Druitt was also later retained on a separate personal services contract by ONAREP, an indication of its satisfaction with his performance.

The seventh personnel change was the arrival in February 1984 of S. Malaty as Senior Planning Advisor. Malaty spoke fluent French and worked with the head of the Planning and Studies Division. His contribution is difficult to assess as he had not much time to become involved in ONAREP's activities which at that time were focused on exploration. In addition, he became embroiled in internal team tensions.

At AID/Rabat's insistence Malaty was designated chief of mission, replacing Hood. The other team members resented this, but in terms of the local AID mission, Malaty was viewed as an

improvement. In their view, he got results, i.e. sent reports to them and established agendas. The contentiousness which arose within the team resulted in Malaty submitting his resignation three months before the project's completion date of October 1984. AID/Rabat responded strongly to his proposed resignation, finding that three chiefs of party was "most unsettling" and stating that "either Bliss, Houle, or both are 'over their head'". Malaty was finally convinced to stay. This confusion annoyed not only the local AID representatives but also the Moroccans.

Thus over the course of the project numerous personnel changes occurred. Some of these changes were caused by ONAREP's gift in its goals, others by personality conflicts within the Bechtel team, and some resulted from the initial assignment of personnel inappropriate to the project.

Personnel effectiveness, of course, was also limited by counterpart capability. For example, at least one senior ONAREP administrator is obviously incompetent but remains at ONAREP because of important political connections. In such a situation the expertise of the consultant was clearly useful to ONAREP but wasted on his counterpart who gained nothing from the association. But without changes in ONAREP's own internal staff, it may be difficult to improve the organization.

A better language capability could have also improved counterpart relations, but the petroleum industry is not known for its linguists, and given the level of technical specialization desired, it is difficult for any contractor to provide such expertise. While the new contractor, Williams

Brothers, shows some improvement in this area, its personnel are still generally weak in language skills, meaning that further training will probably be required.

ONAREP's hierarchical setup also stood in the way of the proper identification by AID of what types of project personnel would be most useful. Several ONAREP division chiefs complained that they had not been consulted either on the Bechtel project or the Williams Brothers contract as to (1) the terms of the contract, (2) their respective needs, (3) the background qualifications of the advisers, and (4) other forms of assistance they might need. Instead, they were presented with a fait accompli.

The new contract with Williams Brothers attempts to avoid some of the problems which occurred with Bechtel. Several conditions are placed on the new contractors:

- 1) regular in-country training seminars were required;
- 2) ONAREP was required to spell out specifically what it would provide as counterpart services, instructing AID what it expected AID to fund;
- 3) the scope of work was defined in terms that as best as possible the results could be quantified;
- 4) all drilling and field work was eliminated from the project, leaving those activities to the World Bank;
- 5) short-term work activities were specified more closely;
- 6) short-term consultants would be, at least half of the time, financial experts;
- 7) the reporting format to AID was spelled out;

8) none of the contractors could arrive in Morocco until ONAREP designated his counterpart, and

9) a confidentiality statement was included so that the contractor would be obligated to respect ONAREP's rules.

In addition the new contractor has appointed a mission chief who speaks French reasonably well although not fluently. He is also a senior specialist in his field and some of the administrative work will continue to be handled by a local hire, reducing a portion of his burden.

It remains to be seen whether this new approach will work more effectively than the old. It may involve too much management by AID in a mission already understaffed and overburdened by new activities. But at least it is hoped that a closer understanding between ONAREP, the contractors, and AID will be achieved. If that is so, then the Mission contract will have benefitted somewhat from the missteps of its predecessor.

c. Interagency Interaction

There was a good deal of interagency and intra-agency interaction from the beginning. The World Bank, for example, has been very active in promoting the development of Moroccan gas and oil. A World Bank loan led to the first important discoveries in the Meskala field, and the Bank has allocated a total of some \$125 million to developing exploratory wells at Meskala and to sponsoring consultant help by A.D. Little and Elf Aquitaine to ONAREP for development, promotion, and training. There has been some concern expressed about overlap between AID and World Bank assistance. However, the continued AID help has been justified

in terms of AID's primary focus on long term institution building and on its broad geographical scope, compared to the World Bank concentration on the Meskala field. Furthermore, several respondents felt that even more funds than those supplied by both agencies could have been usefully spent, since the area to be explored was large and technical expertise and equipment were in such short supply. Also, AID has provided somewhat more extensive help in planning, institutional development, and training. In particular, some respondents felt that the World Bank direction on their assistance had been lax, that consultant firms like Elf Aquitaine had not provided first string staff, and that ill-considered procurement actions by ONAREP had been tolerated: AID assistance was seen as being a potential help in influencing better Moroccan decision-making. At any rate, there has been a good deal of coordination on an informal but frequent basis between World Bank and AID staff.

A critically important intra-agency interaction was between the AID Mission in Rabat and the S&T/EY Conventional Energy project. It is established S&T/EY policy to stimulate energy programs by the missions. Under this criterion, the present situation, in which the activities of the project have been recently transferred to Mission auspices under a new contract is ipso facto evidence of successful cooperation in this area. It is worthy of note, however, that there appeared to be strong independent motivations for the implementation of the Mission-supported follow-on program. Our interviews gave us the impression that the U.S. Embassy is pushing expanded AID projects not so much for any particular interest in promoting ONAREP, but

more as a result of the U.S. ambassador's personal relationship with the King and the extensive program of U.S. military sales to Morocco. This special relationship apparently resulted in Morocco being designated an Economic Security Fund (ESF) country when it ran out of hard currency. The AID Near East Bureau reportedly originally did not want ESF funds, and once it had agreed to such funding, did not want funds used to finance commodity purchases -- thus leaving \$5-10 million for financing project activities. This superfluity of funds may partly account for the Mission's interest in taking over the ONAREP project from centrally-funded programs in Washington once the initial project was terminated.

It must be noted that intra-agency interactions were not trouble-free during the period of the S&T/EY contract. Some ill feeling developed in the nexus joining AID (Washington and Rabat) and Bechtel and ONAREP over lack of agreement on whose instructions Bechtel should have been following at various decision points. One respondent suggested that project direction from S&T/EY and advice from the Mission could have been better coordinated. While this may be true, it should be noted that the project was hampered by general restrictions placed on travel at critical times owing to an inadequate travel budget. Likewise, at the time of the project telephone communication was particularly difficult owing to the non-availability of direct dialing.

Another area of interaction was between this project and another project also sponsored by S&T/EY, the Energy Planning program. This program, while centered in giving technical

assistance to staff of the Ministry of Energy, also included contacts with ONAREP staff. A certain amount of interaction therefore took place between the two AID projects, in particular with regard to assistance in pricing policies for natural gas from the Toukimt gas field. Given the built-in difficulty of coordinating two different AID projects with two different government agencies (Ministry of Energy and ONAREP), the degree of interaction achieved should be judged to be better than average.

d. What is the Impact on Development?

Impacts on development so far have been very indirect and at best difficult to trace. The project goals included (a) gas exploration and development, (b) institution building, and (c) private sector promotion activities. There has been palpable assistance in such field operations as drilling programs, a certain institutional development at ONAREP and some help with the promotion of oil and gas leasing to private outside firms. However, the overall prospect for commercial development of gas fields has so far not been as positive as had been hoped. Exploration has been slower than planned partly because of unfortunate or ill-conceived drilling patterns. Furthermore, the structural features of the deposits have been more difficult to deal with than anticipated, and projections of recoverable reserves have not so far backed up earlier optimism. By late 1984 there still remained a need for geological and geophysical surveys of the Meskala range as well as elsewhere. Greater attention by ONAREP to this first step in exploration from the

start might have resulted in greater project results.

Meanwhile, actual gas production has been at low levels. Therefore, concrete developmental benefits in terms of energy delivered of the program have been small or negligible. Institution building is difficult to evaluate. Technology transfer of American skills to ONAREP staff was one of the major objectives of the project. Formal training seminars in-country were established by Bechtel and AID through its training program in the U.S. In February 1982 a target of ten Moroccans per year were to receive energy training in the U.S., between 1982-1984 (but through another AID program). Still most Moroccan respondents indicated dissatisfaction with the infrequency of the in-country seminars, the inadequacy of translation services, and the lack of on-the-job training of Moroccans in the U.S. Greater emphasis on training and the costs related to it could have been built-in to the original project design.

For example, a task related to training and institution-building is the provision of documentation services, such as subscription to key periodicals. ONAREP lacks such a documentation service and one could reasonably have been provided with the project. Such materials are also one way of exposing Moroccans to American technology and to companies whose services they might later wish to employ.

Institution-building at ONAREP posed a special problem in this particular case because AID for policy reasons is not supposed to be involved in improving the capabilities of a government-owned oil company. This problem was partly defused by specifying that, while AID could not be involved in field

production decisions, it could be involved in management training, especially in the financial management advice badly needed by GOM staff. On the other hand, in practice the contractor provided production specialists, not financial analysts.

ONAREP does have an impressive and talented staff eager to acquire new American techniques and employ them in Morocco. However, ONAREP has personnel problems of its own. Decisions are often taken for internal GOM political reasons. This process tends to weaken AID's efforts at institution building, but it is a process over which AID staff and contractors have only a limited influence.*

It must be kept in mind, however, that institution-building is a subtle process that is not easy to monitor, and further effects of the AID project will probably be felt in future years.

Promotion activities became a major target of AID's institution-building objectives. These activities developed as a target of opportunity once the project had begun, as large oil companies developed more and more interest in Moroccan petroleum

* Institution-building continues to be a major focus of the on-going mission-funded project with ONAREP and the World Bank. The new Williams Brothers contractors have as their objective providing technical assistance and training the help ONAREP "build its internal capability." A World Bank representative on May 8, 1984, said that the Bank's greatest concern was (1) ONAREP's "inability to manage its drilling operations and control the time and cost thereof" (admittedly an area where there was no contractor involvement) and (2) ONAREP's inability to manage the Meskala project. Although the World Bank's exposure is much larger than AID's, only recently has the Bank become concerned about ONAREP's technical inadequacies and is now seeking to exercise tighter control.

deposits. The individual involved in the Bechtel team's promotion work, Dan Sullivan, was later kept on by the new contractor, William Brothers -- an indication of his acceptability both to AID and GOM. Sullivan was originally hired as a Petroleum Geologist, but the Director-General of ONAREP, Douieb, assigned Sullivan to the promotion tasks because of the need to mount a promotion package for foreign investors.

The main promotion activity for Moroccan oil was financed by ONAREP through a World Bank loan, employing Gaffney-Cline and Associates, who in turn worked with Sullivan. It resulted in a promotion tour in the U.S. in which M'Barek Ali Mouhsine, the ONAREP Petroleum Participations Division Manager, and Sullivan participated. Our evaluation team could find no evidence, however, that this promotion activity had yet resulted in a tangible increase in foreign investment.

A Mission official indicated that oil companies have come to believe that significant deposits of oil exist off-shore and on-shore -- but that ONAREP promotion activities were not the reason for their renewed interest. A staff member of one international oil company currently involved in exploration activity said that its decision to drill had been made prior to viewing the Gaffney-Cline presentation but that Sullivan's work had made them more interested in on-shore activities. The company was now reviewing survey material made available by ONAREP. On the other hand, another respondent thought that the Gaffney-Cline presentation itself was not very well done, and another oil company staffer indicated his firm was already knowledgeable about the Moroccan

hydrocarbon picture and did not benefit from the ONAREP briefings.

There are staff problems in hydrocarbon promotion at ONAREP, Mouhsine appeared to this evaluation team to be incompetent to handle promotion activities with Western companies. For example, he had difficulty in providing team members with information on Morocco's investment code. Indeed, another respondent indicated that Morocco needed a "better promoter". This was given as one reason for Sullivan's secondment to that division: Morocco needed a "Willy the Wildeat", according to one, who could talk to Western oil companies. While this type may in fact not be precisely what Morocco needs, Mouhsine, with his calendar from the Soviet Atomic Power Export Corporation hanging in his office, is obviously a stumbling block to successful promotion. Several Moroccan respondents mentioned the need for better promotion services, including relatively sophisticated promotion materials. ONAREP does appear to have difficulty in providing on a timely basis the type of survey materials which would interest private sector representatives.

However, Sullivan's work and pressure from donors does appear to have made some contribution to improving the investment climate in Morocco. In any event, GOM has recently instituted a new investment code with a more favorable package of incentives for investors. Therefore, some credit for promotion assistance should be given to the S&T/EY project.

Thus, the project's net impact on the country's development to date is not substantial, although this type of program, given its start-up problems and ambitious targets, is by nature

difficult to assess after less than two years in operation. One respondent, it may be noted, pointed out the fact that results on such projects should be expected more on a 5-10 year time frame, rather than the shorter periods often assumed in project planning.

3. Generic Lessons

In this section, generic lessons to be drawn are treated, in terms of: gaps in project data, effectiveness of project type, implications for a Technical Advisory Committee, evaluation needs, the private sector, replication problems and general conclusions.

a. Gaps or Duplication in Project Data

Gas exploration is by its nature a skill, but it is also an art as applied to any particular locality. Therefore, technical assistance given in the form of consultants to a parastatal concerned with hydrocarbon exploration in Morocco must have individual features that are not duplicated elsewhere. Therefore the technical data obtained on the project could not well have been obtained elsewhere, nor can they be used without modification in other projects.

b. Effectiveness of the Type of Project for Energy Assistance

Theoretically, this type of aid -- to develop local skills at the same time as helping develop national resources -- seems capable of giving maximum leverage to U.S. dollars in upgrading and utilizing neglected human and physical resources in developing areas. In practice, the results may be somewhat less impressive. Any team of consultants will necessarily lack certain abilities and skills. For example, in the Moroccan case consultant deficiencies in French language capability were inconvenient in the office setting and a severe drawback in

drilling operations in the field. (Incidentally, it is not clear why consultants cannot be ~~tested~~ for actual--vs. claimed--language capabilities.) Counterpart staffs will also have their inevitable deficiencies. Sometimes it is an interaction between the two that causes problems, as in conflicts in Morocco on the choice of drilling mud that reportedly contributed to the resignation of one consultant. Even with the best consultants in the world, if organizations like ONAREP make ill-considered drilling decisions, the expertise of the consultant will come to naught. On the other hand, one Moroccan correspondent thought that much of the expertise brought in by the outside consultants was not needed and that the main function of the consultants should be as translators of technical material from French into English. If such were indeed the case, the cost-effectiveness of the project would have to be rated very low indeed.

Politics aside, there remains a serious question as to whether this kind of aid in conjunction with counterparts is more effective on purely cost-effectiveness grounds than operations carried out by expatriate exploration and development teams on their own. Probably the political and local resource availability situation will dictate what the best approach is in the generic sense.

c. Technical Advisory Committee

The original project scope of work envisaged a Technical Advisory Committee which was not, in the event, formed. Our team asked respondents their opinion of this idea. Most Moroccan respondents indicated no particular need for a Technical Advisory

Committee for this project. However, it should be noted that ONAREP staff people reviewed typically had their own particular ideas of the kind of technical expertise needed and were more concerned with getting that particular expertise than with any general project considerations. It seems possible that a Technical Advisory Committee at a program level could have perhaps monitored more closely the changing gas/oil situation in Morocco mentioned above. It is also possible that a Technical Advisory Committee might have had some views of the general choice of this project vis-a-vis other possibilities, given concurrent World Bank interest in very similar areas. One respondent thought that a Technical Advisory Committee could have helped in writing the RFP, for example, in the detailing of particular types of technical assistance in drilling, versus time spent in training or in promotion. On the other hand, since the particular subordinate goals of the project were viewed in different ways by different Moroccans and Americans involved in the project, it is difficult to define "correct" decisions as to the type of technical aid given and also to suggest how a Technical Advisory Group operating at a distance could have been improved the making of concrete decisions depending on in-country conditions.

d. The Need for Evaluation

The key question for evaluation is whether AID has been following a reasonable course in pursuing this line of assistance in Morocco. The results of our investigation tend to suggest that there has been a degree of lack of responsiveness to the

changing outlook for the petroleum sector in Morocco. That is, when this project started, the outlook for oil was dim but the prospects for gas appeared promising. Therefore a program of technical aid to a parastatal for gas development seemed logical. But gas prospects have now dimmed somewhat, while there is a great deal of interest on the part of the major oil companies in finding commercial-sized oil deposits in Morocco. Mobil, SOHIO, and Esso, as well as smaller companies like Oxoco (Houston) have signed new agreements or expressed interest in exploration. Amoco has been especially active in both onshore and offshore drilling plans.

The original project, therefore, may have been overtaken by events. Admittedly, it is difficult for AID to change directions on existing contracts and it is even more difficult to change planning priorities and staff capabilities within ONAREP to respond to such events. Furthermore, both ONAREP and AID did take steps to deal with this trend in planning an increasing stress on promotion activities and in having assigned the regional exploration consultant to a number of promotion activities. However, oil company respondents differed on whether the presentations of Moroccan resource potential carried out as part of the project had had any measurable positive impacts in promoting new development.

In contrast to this line of criticism, some respondents believed that, although the original Meskala finds might turn out to be of only marginal interest, other as yet unexplored gas deposits might prove interesting. Furthermore, one respondent,

while stressing the importance of new oil exploration by the majors, believed that ONAREP could "use all the help it could get." At any rate, there are lessons for AID in making sure that project redirection reaction times be kept reasonably short. Whether informal evaluation measurers can accomplish this goal is uncertain. A mid-project evaluation carried out by a 3-man team in May 1983 gave little help in this regard, for example. The need for an ongoing evaluation of some sort, formal or informal, seems to be evidenced in this project.

e. Private Sector Strengthening

This project was undertaken in the context of a belief that no capabilities existed within the private sector to significantly aid in developing the Moroccan natural gas. Indeed, under Moroccan law, purely private exploration was not permitted. Consequently, all the project aid went to the state entity ONAREP. As a fallout from the project, if it had successfully produced significant amounts of gas, industries or homes might have been supplied with gas, and the industrial and household parts of the private sector might have been aided. In fact, the production consultant on this project devoted considerable effort to pipeline planning in support of proposed sales of industrial gas to cement plants, sugar mills, power stations, and fertilizer plants. In the event, schemes to sell Moroccan gas to private or parastatal industries have mostly fizzled out. According to one respondent, plans to base new industries on gas fell through because of uncertainties about long-term supply potential. Therefore, little direct generic help can be derived from this

project in future dealings with the private sector.

However, in another sense this project may have succeeded in somewhat loosening up the ONAREP hold on exploration and development. At least one respondent believed that ONAREP management was becoming more convinced of the need for divestiture of drilling operations to private entrepreneurs under contract to ONAREP. This would be an important step to cure some of the ills of sometimes unwieldy cooperation between outside consultants to ONAREP and ONAREP staff in carrying out actual field operations.

f. Replication Problems and General Conclusions

This type of technical assistance project, supplying consultants to a governmental organization, is easily replicable. However, some of the project experience with the usual types of planning deficiencies and delays and errors in implementation could be considered as important "lessons learned" for future projects. Unfortunately, the human equation is key in all such efforts. This project suffered, according to many respondents, from grandstanding of the part of some consultants. On the other hand, other consultants proved to be exceedingly skilled and flexible in attuning themselves to local strengths and deficiencies and in getting more done than might have been thought practical. The choice of the individual project member and of his counterpart is therefore a critical factor -- but not easy to analyze in a generic context.

A related problem is the relationship between the consultants and the host institution hierarchical chain of

command. Having consultants in line positions has caused problems in other projects, and one respondent came out strongly against this policy. Nevertheless, the lack of administrative power on the part of the consultants here reportedly led to wasteful decisions in many cases when their expertise was ignored. Furthermore, some respondents felt that the consultants had far too many bosses -- at Bechtel, ONAREP, and at AID in both Rabat and Washington. There is no easy answer to these problems, but planners have to face their consequences.

Other lessons include the need to be more stringent about language requirements. Perhaps the requirement for some personnel is not necessary: some Moroccan respondents (but not all) thought that French was not essential for deskwork. On the other hand, where the language is important, testing and remedial work where necessary could be a cost-effective strategy.

The complexities in the quadrilateral relationship between AID/Washington, AID/Rabat, ONAREP, and Bechtel were an obvious opportunity for trouble. Perhaps under the circumstances the relationship worked surprisingly well. However, tighter control over contractor actions in future projects by the funding agency might help to alleviate this problem.

Finally, the ubiquitous problem of long-term development needs versus short-term budgeting also applies in the conventional energy field. In a case like the exploitation of the Moroccan petroleum resource, the time lag for both staff training and field exploration is long enough to make the "funding myopia" problem even worse than it is for most development projects.