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UNITED STATES GOVERNMENT

Memorandum

TO : Mr. Joseph C. Wheeler
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FROM : *E. H. Gustman, Jr.*
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SUBJECT: Memorandum Audit Report No. 5-271-80-1
Joint U. S. -Israel Desalination Project
No. 271-0005-6258324

DATE: Oct. 15, 1979

INTRODUCTION

On June 27, 1975, the U. S. and the Government of Israel (GOI), signed a joint agreement for the design, construction, testing and operation of a large-scale prototype water desalination plant to be built in Ashdod, Israel, an industrial city south of Tel Aviv.

The purpose of the joint agreement was to:

- improve existing technology, to develop and advance new technology and to gain experience in the design and construction of large-scale desalting plants of advanced concepts, so as to contribute materially to the achievement of low cost desalination in all countries;
- deepen and extend cooperative working relations and to facilitate the exchange of desalting and related technologies between the technical and scientific communities in the two participating countries; and
- make feasible through improvements in technology the large-scale production of desalted water for use in arid and semi-arid areas of the two countries.

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The project encourages the following objectives:

- The development of conceptual and detailed designs for a prototype desalting plant of approximately 10 million gallons production capacity per day to be coupled with an existing power plant.
- The design, construction and operation of a six-effect Intermediate Test-Module for subsequent incorporation into the final prototype plant.
- Construction, operation and maintenance of the prototype plant for several years following the completion of construction, and
- Evaluation and reporting of the Intermediate Module and prototype plant to determine technological and cost feasibility of constructing and operating large-scale desalination plants.

The project was estimated to cost \$55 million. AID agreed to finance 50 percent of the total capital costs and 50 percent of the operation and maintenance costs for the operating demonstration period, or \$20 million whichever is less. The GOI will contribute \$35 million for both capital and operating costs and will be responsible for all cost overruns. The GOI also agreed to contribute the land and the existing power plant and related facilities at Ashdod.

The GOI, acting through the Ministry of Energy and Infrastructure, has basic responsibility for project design, implementation and management. This responsibility is exercised through the Israeli Office of the Project Manager (OPM), which is the principal entity for day-to-day project management, review and approval of project actions, including engineering design, technology inputs, contractor performance and reporting.

The Joint Agreement provides for the utilization of the services of U.S. technical experts. Consequently, AID entered into a Participating Agency Services Agreement (PASA) with the Office of Water Research and Technology (OWRT) of the U.S. Department of Interior to provide technical and administrative expertise to assist in project implementation. Therefore, U.S. responsibilities are exercised through AID with technical support from OWRT. AID relies on the Israeli OPM for project management and review and approval of day-to-day project actions. However, through their technical representatives, AID has responsibility for review and approval of key project actions such as preliminary, pre-final and final design of the intermediate module and the 10 million gallon per day prototype. AID also has responsibility to review and approve major Invitation-for-Bid (IFB) documents and contracts financed with AID grant funds and is responsible for advising OPM about new technology for possible use in the design and construction and in acquiring technology from the project for the U. S.

As of August 31, 1979, AID expenditures have amounted to \$1,056,235. Of this amount, \$493,193 has been expended under the PASA agreement through June 30, 1979 and AID has reimbursed the GOI \$563,042 of the \$3.2 million expenditures incurred by the GOI.

This interim examination of the Joint U.S. -Israel Desalination Project No. 271-0005-6258324 covered activities through September 21, 1979. The purpose was to evaluate the effectiveness of project management, progress toward project objectives, and to determine the degree of compliance with governing agreements. Our review included an examination of pertinent documents, records, and reports, inspection of construction activities at the testing and project sites, and discussions with officials of the GOI, Embassy and AID/OWRT.

FINDINGS AND CONCLUSIONS

The project has been plagued with major managerial problems at both the engineering and administrative levels. Thus, progress has been slow and the project is about two years behind schedule. However, during the past six months, the management structure has been reorganized to facilitate implementation of the project and provide an effective approach for carrying out the objectives of the joint agreement.

Reorganization of Management Structure

The project management and coordination problems involved managerial relationships, obligations and responsibilities of all concerned parties. Specifically, the management of OPM was weak with the general contractor (a government firm), Israel Desalination Engineering Limited (IDE) controlling much of the day-to-day activities of the project. AID/OWRT representatives were excluded from meetings and necessary background information. The GOI project representative from the National Council for Research and Development (NCRD) regarded OPM and AID responsibilities to be limited and gave greater authority to IDE than to the OPM.

Due to constant pressure on the GOI from the AID/OWRT representatives to remedy these problems, together with support from AID/W and the Embassy, the GOI took corrective action to reorganize the management structure of the project.

Under the reorganization the GOI has become more actively involved. The project was transferred from the National Council for Research and Development to the Office of the Director General of the Ministry of Energy and Infrastructure, thus raising the level of GOI involvement. As a result, the Minister and the Director General have become directly involved and, because of their direct involvement, it has become clear to all parties that the OPM is totally responsible for daily management of the project.

The GOI appointed a new Managing Director in February 1979. He was given the added authority of being both the Government's Representative and Project Manager of the OPM. Under his direction the project has continued to progress and the working relations and responsiveness of all Joint Project participants has improved considerably.

In addition, a Joint Steering Committee with representation from both governments was established in May 1979 to deal with major project issues that cannot be resolved by the OPM. The Joint Committee will also provide a forum for periodic review of project progress, review of annual budgets, and for resolving major project differences between AID/OWRT and the GOI. The first Joint Steering Committee meeting will be held in Washington, D. C. in early October of this year.

As a result of the above changes, it will take time to see if the attitude of the general contractor will change from the position of controlling the project to that of being controlled. According to the AID Project Officer, it now appears that the general contractor recognizes the role of OPM in project management.

Accomplishments

Certain engineering and technical issues between the IDE, OPM and AID/OWRT have been resolved. For example, the specific design of the intermediate module involved the choice of design for a flash chamber and final condenser. In addition, AID requires backup material and justification for all major designs. In the past IDE resented direct technical input from outsiders such as OPM and AID/OWRT.

The issue of a flash chamber was resolved by IDE adopting design proposals submitted by the AID Project Officer. The final condenser design was resolved by compromise through acceptance of the IDE design for the intermediate module and an OPM design for the prototype. In addition, most of the technical justification such as background documents was submitted by IDE allowing OPM and AID/OWRT to approve the preliminary design.

An important technical design decision was made in November 1978 to design the intermediate module as a prototype for simulation of a nuclear power plant combined with water production. This goal was given higher priority compared to the original goal for the intermediate module of testing and verifying prototype plant designs. According to the AID Project Officer, this goal will be of major technical benefit to both parties, particularly the United States.

Recently, major milestones in the project have been achieved. For example:

- (a) The preliminary design submitted by IDE for the prototype plant in Ashdod, including the intermediate module, was approved on June 4, 1979.
- (b) Notice to proceed with prefinal design was issued on June 4, 1979 by the Managing Director and the AID Project Officer.
- (c) The three-way contract between Israel Electric Company, IDE and GOI, with full participation by AID/OWRT is in final draft.
- (d) The final version of the long-awaited procurement manual was prepared and sent to AID/W on July 24, 1979 for approval.
- (e) Procurement for all major pumps, necessary for the intermediate module, was approved on September 6, 1979 for an estimated \$190,000.
- (f) IFB documents for major procurements such as steel, aluminum tubing and a vacuum system have been initiated.
- (g) The entire project has been updated using a Planning Evaluation Review Technique system which is monitored closely with the goal to complete the construction of the intermediate module before October 1981.

- (h) A work breakdown structure was prepared by IDE and revised by the new Managing Director which allows close monitoring of all activities.

Annual Technology Report

The joint agreement, Section 2.02(d), requires the Project Manager to prepare an annual report on technology describing the technology developed under the project. The general contractor, IDE, is contractually obligated to provide the OPM information concerning technology developed by June 1 of each year. This information combined with OPM comments should constitute the annual technology report.

According to the joint agreement the form and content of this report must be mutually agreed upon by both parties of the agreement. The contents of the annual technology report was agreed to in May 1979.

The AID/OWRT staff have made many requests for the annual technology report since their involvement with the project. More recently, the Managing Director of OPM has requested IDE to prepare an updated Research and Development (R&D) program defining the scope and the parameters of their R&D work and to provide the necessary information for the technology report. The original budget estimate for R&D expenditures was \$1.8 million. However, to date IDE has already spent that amount but still has another five years to go before the project will be complete. According to the AID Project Officer, if the R&D work is properly documented this will be of direct benefit to the U. S.

IDE submitted its R&D reports to OPM on September 6, 1979 including a technological progress report. The OPM staff has reviewed the reports and has included their comments. A draft technology report was prepared and submitted on

September 20, 1979 to the AID/OWRT engineer for incorporation of his comments. Thus, the first annual technology report will be forthcoming in the very near future.

While the project is about two years behind schedule and progress has been slow, recent corrective action, as discussed above, has brought about major improvements and a complete turn around for the project. As a result of the recent changes and achievements, we have no recommendations.

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Office of Egypt/Israel Affairs (NE/EI)	1
Bureau For Development Support:	
Office of Development Information and Utilization (DS/DIU)	4
Office of Legislative Affairs (AA/LEG)	1
Office of Auditor General:	
Auditor General (AG)	1
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