PD-ABE-372
ISN 67392

Agency for International Development	1. Cooperating Country Sudan	Page 1 of 10 Pages
PACR Project Assistance Completion Report	2. Project Name & Number Energy Planning & Management 650-0059	

3. Functional Account(s) SDA

4. Project Assistance Completion Date (PACD)
Original 3/31/88 Amended 6/30/89

5. PRO/AG No. and Date
650-0059 - August 31, 1982

6. Type of Agreement and Grantee: Democratic Republic of the Sudan

X Grant ___ Cooperative Agreement ___ LSGA ___ Other

7. Financial Inputs

Project Element		PP Budget	Latest Budget	Earmarked	Unearmarked
#1 Technical Assistance	Dollars	4,916,300	6,708,000	6,701,363	6,637
	LS	4,024,300	5,800,000	3,593,198	2,206,802
#2 Training	Dollars	647,600	919,000	884,169	34,831
	LS	394,800	800,000	540,049	259,951
#3 Commodities	Dollars	388,800	772,613	763,007	9,606
	LS	229,200			
#4 Evaluations	Dollars	647,300	50,387	50,387	- 0 -
	LS	526,700	21,000	21,000	- 0 -
#5 Other Costs	Dollars				
	LS	420,000	797,000	3,231,872	(2,434,873)
#6	Dollars				
	LS				
Totals	Dollars	6,600,000	8,450,000	8,398,926	$ 51,074
	LS	5,595,500	7,418,000	7,386,119	LS 31,881

Ls: Trust Fund 7,418,000
Counterpart 4,134,000

8. Outputs

Expected Outputs	Actual Outputs
A. NATIONAL ELECTRICITY CORPORATION	
(1) Increase the short term reliability of Blue Nile electric power grid.	1. Short term reliability went from 74% to 94% by January 1987.
(2) Improve managerial and financial capability of NEC to generate, transmit and distribute power.	2. A marked increase in NEC revenues occurred during the LOP.
B. NATIONAL ENERGY ADMINISTRATION	
(1) Improve capability of NEA to plan, program and implement efficient use of Sudan's energy resources.	1. NEA is independently preparing energy studies and functioning as a consultant for various GOS and international agencies.
C. GENERAL PETROLEUM CORPORATION	
(1) Improve capability of GPC to plan, program, and implement efficient use of Sudan's energy resources.	1. GPC component was never funded.

9. Remaining Actions

a. Monitoring: N/A

b. Covenants and Conditions: N/A

c. Audit Recommendations: No audit was performed

d. Status of Final Evaluation: Completed

e. Estimated Deobligation Amount: Approx. $ 87,000

f. Terminal Date for Disbursement: March 31, 1990

10. Close Out Check-List

X a. The Project Officer, in conjunction with the Controller and Contracting Officer, has reviewed all AID-financed commitments (contracts, sub-grants, PIO/Ts) to ascertain what, if any, amounts remain to be billed and paid; to discover any disputes that have arisen or are likely to arise and to expedite their settlement to the extent possible. An accrual worksheet has been filled in with the help of the Controllers office and all amounts committed but no longer required have been de-committed.

X b. The Project Officer, in conjunction with the Controller and Contracting Officer, has reviewed all earmarking documents to ascertain whether all disbursements can be made under existing earmarking documents and, where necessary, to make appropriate adjustments to ensure that sufficient funds will be available to cover all anticipated disbursements. All earmarked funds in excess of those required to complete the project's activities have been de-earmarked.

X c. Official project files have been cleaned up and organized, those no longer required for implementation and monitoring have been retired to storage.

11. Other Comments

12. Clearances:

Project Manager JFranckiewicz	Date 5/14/90	Contracts Officer DOsinski	Date 6-21-90
ARD Officer KRandolph	Date 5/14/90	Controller HShropshire	Date 6/20/90
Project Officer RYoussef	Date 5/20 5/16/90	Program Officer DDijkerman	Date 5/23 6/23/90

13. Authorized

Frederick E. Gilbert
Mission Director

Date 6-26-90

ENERGY PLANNING AND MANAGEMENT PROJECT
(650-0069)

PROJECT ASSISTANCE COMPLETION REPORT

1. PROJECT DESCRIPTION

In 1982 USAID/Sudan proposed the Energy Planning and Management Project (EPM) to strengthen three key institutions in the energy sector in Sudan. The three institutions are as follows: National Electricity Corporation (NEC), National Energy Administration (NEA), and General Petroleum Corporation (GPC). The project was designed to ease energy-related constraints to economic recovery while contributing towards the long-term goal of providing Sudanese energy requirements in an efficient, appropriate manner.

The NEC component of the project covered two sectors. The first sector was infrastructure improvement, increasing the short term reliability of the Blue Nile electric power grid. The second sector dealt with management assistance and the NEC computer center; it was designed to improve the managerial and financial capability of NEC.

The NEA component of the project was to establish this agency as an accepted and respected central source of useful energy data which would support policy and investment decisions in the energy sector. NEA had been created by USAID in 1980 under the Sudan Energy Policy and Planning Project. EPM was a follow-on activity to further strengthen and train the NEA staff.

Although the EPM project as originally planned called for the provision of technical assistance to the GPC in a number of areas, these activities were never funded because of irregularities in GPC's petroleum purchases under a U.S. CIP Grant. As a result, in 1983 the Mission decided to terminate all proposed GPC technical assistance under the EPM Project.

2. PROJECT STATUS

All project inputs/contracts were completed by the PACD of June 30, 1989 with the exception of one missing line item on a commodity procurement which is being followed up with a bill of collection.

A. Technical Assistance:

Harza Engineering Company's technical assistance contract to the NEC was for the period March 1, 1984 to April 30, 1989. Harza had responsibility for upgrading the NEC computer center and also improving organization and management capabilities.

Energy Development International's (EDI) technical assistance contract to NEA was for the period March 1, 1984 to August 30, 1988. EDI assisted the NEA in institutional development and complementary activities which included energy planning and policy analysis, technical studies, and information systems. International Science and Technology Institute also participated in EPM during April 11, 1983 to April 30, 1989 by supplying an energy advisor to USAID who had primary monitoring and technical responsiblity on the EPM Project.

B. Training:

NEC and NEA received both in-country and overseas training which had all been finalized by the PACD. Short-term training was provided in formal classes and also in many informal training sessions. The overseas training included participation in international workshops and seminars and degree training; forty NEC participants were trained in Egypt and the United States; NEA training was conducted in country by EDI. NEA personnel did receive degree training through complementary USAID energy training programs.

C. Commodities:

All commodities were procured and in country by the PACD. One procurement contract has an outstanding bill of collection to purchase two computer controllers that were lost in transit.

D. Evaluations:

A mid-term evaluation was conducted by Oak Ridge National Laboratory in Jan-Feb 1987. A end of project review was completed by William Barron of Oak Ridge Associated Universities in June 1989.

3. PROJECT ACCOMPLISHMENTS

Excerpt From 1987 mid-term evaluation

> The NEA component of the EPM Project has scored notable achievements in five major areas. (1) It has assisted in implementing a reorganization of NEA into a more task-oriented form. (2) It has strengthened NEA's computer capabilities with hardware and software acquisitions, a major study of computer system needs, and implementation of several of the study's major recommendations. (3) It has brought NEA to the point of publishing NEA Sudan Energy News on its own. (4) It has assisted in several survey data collection efforts. (5) It has assisted in the preparation of over ten analyses of energy issues and/or policy options.

The NEC component has made achievements in eight major areas. (1) It is completing computerization of a billing and collection system that already has increased NEC's collected proportion of accounts receiveable by 10% in its first year of operation. (2) It has prepared a long-run marginal cost tariff study, results of which NEC began implementing in January 1987. (3) It has trained six NEC engineers in the operation of a telecommunication system installed with previous USAID funding. (4) It has instituted systematic record keeping at NEC's Vehicle Maintenance Center. (5) It is training mechanics in the Vehicle Maintenance Center in engine, electrical system, and gear box repair. (6) It has increased the percent of NEC's vehicles that are in operation. (7) It has planned and initiated the installation of capacitors bought with USAID Commodity Import Program (CIP) funds. (8) Overall, the activities of the EPM Project have contributed to an increase in system reliability of the Blue Nile Grid from 74% in 1983 to 94% in 1986.

During the last two years of the project, NEA staff received training and technical assistance from two contractors, International Science and Technology Institute and Energy Development International. Final activities on the project also included additional computer and electrical equipment to upgrade the computer facilities at both NEA and NEC. Harza finalized all management activities and training in computer operations. NEC utilized four application systems in the main computer center; all four application systems were reprogrammed and upgradedduring the last two years of the project.

Training:

NEC staff received approximately 246 person months of short term training overseas under EPM as well as a significant amount of the long term advisor's time devoted to on-the-job training activities. Through EDI, NEA received numerous formal and informal short courses on various subjects related to energy planning.

Commodities:

EPM provided moderate levels of commodities through procurement by the technical assistance contractors. Harza purchased $96,000 worth of electrical equipment and spare parts for NEC. The largest expenditure was for instruments for calibrating electric meters and measuring line losses, and other expenses were for the computer center and vehicle parts. EDI purchased personal computers, related hardware, and software for a total expenditure of $37,000. USAID directly procured $ 180,000 of computer equipment for the NEC computer center and fifteen vehicles for NEC and NEA.

A Commodity Import Program for $21 million worth of electrical equipment and supplies ran concurrently with the EPM project. Aside from vehicle purchases for both NEA and NEC, the CIP funds were used exclusively for NEC to rehabilitate the Blue Nile Grid and the NEC Computer Center and also to purchase electrical equipment and supplies.

4. DONOR CONTRIBUTIONS/ACTIVITIES

The EPM project was the only major support program to the NEC during 1982-89, with the exception of some training provided by the International Labor Organization. Minor contributions were provided to NEC by the Irish Electricity Supply Board under a previous World Bank-funded activity. The World Bank also helped to shape the NEC tariff study funded under EPM. Other donor activity addressed the thermal power plant expansion program and improvements to the transmission system under the umbrella World Bank-sponsored Power III project presently underway and its successor, Power IV. Continuing equipment suppliers or donors for NEC include: The United Kingdom, Italy, the European Investment Bank, the World Bank's soft loan window-IDA, the Netherlands, Finland, Denmark, West Germany, the African Development Bank, the Kuwaiti Fund, the Saudi Fund, and the Arab Investment Fund.

Other recent donor-assisted activities include the following:

1. Energy conservation activities funded by West Germany

2. Agricultural residue briquetting project funded by UNDP/DANIDA

3. Agricultural residue gasification project funded by France

4. Funding of a national cookstove network by DANIDA

5. Biogas digester activities funded by a Norwegian church PVO and GTZ of West Germany

6. Three World-Bank financed projects:

   (a) $500,000 for energy planning in Power IV
   (b) energy conservation component of World Bank Forest Project
   (c) solar water heater efficiency study

7. Series of training activities funded by the Netherlands, France, Belgium, Italy, West Germany, Australia, the People's Republic of China, the Philippines, Czechoslovakia and the Soviet Union

5. LESSONS LEARNED

Excerpt from 1987 mid-term evaluation.

In addition to its complex implementation history, the EPM project has been beset during its nearly four and a half year life by a series of external events affecting Sudan, USAID, and the global energy economy, which have had significant, but varying, impacts on the project. The project paper set out in its section on key assumptions to project success a series of what its designers believed to be pragmatic assumptions about the institutions to be assisted under the project and the economic and commercial conditions likely to prevail in Sudan. It was assumed that "extraordinary changes in the international price of crude oil and refined products are not expected to occur," that the "overall balance of payments situation in the Sudan will not worsen, and sufficient foreign exchange will be available for the purchase of sufficient if not optimal quantities of petroleum (USAID/Khartoum, 1982a, p.27). Finally, "the continuity of AID funding throughout the life of the project is assumed, and lastly it is assumed that the professional staff at NEC, NEA, and GPC who receive training and other EPM benefits will remain at their posts" (USAID/Khartoum, 1982a, p.28)

The initial assumptions were not prescient and the EPM project must be judged in part within the context in which it has been executed. In April 1985, the 16-year government of Jafaar Nimeiri was toppled in a military coup d'etat, removing the Minister of Energy and Mining and ushering in a military transitional government which lasted for more than one year. This had a powerful effect on the GOS policy environment and created a period when certain types of policy analyses and actions were not possible. The renewal of hostilities in southern Sudan had, by the end of 1983, already produced a postponement of Chevron's planned oil export project, which once had brightened Sudan's economic prospects and energy outlook considerably. The recent dissolution of the White Nile Petroleum Company further emphasizes the minimal likelihood of SPDP moving ahead anytime soon.

The collapse of world oil prices by 70% over a short time interval between 1984 and 1985 offered Sudan the hope of reducing the impact of its petroleum imports on its balance of trade, but also reinforced the demise of SPDP and loosened economic expectations concerning its ability to pay for oil imports. Indirectly, the fall in oil prices hurt Arab oil exporters' economies, lowering remittance incomes from Sudanese working abroad and lessening the flow of Arab donor funds into Sudan's budget.

A crippling drought in 1984 and a series of regional conflicts produced a flood of refugees from within and without Sudan, exacerbating food and transportation bottlenecks in the country. USAID's administration of a major relief effort through 1985 and 1986 appears to have diverted high-level Mission attention from administration of the EPM Project. Election of a new government in March 1986 created yet another political complication, ushering in a new, and potentially more effective, democratic administration, but one forced to begin to define its energy and economic policies anew.

Finally, the deteriorating security situation for Americans and the abrupt evacuation period during 1986 presented the project with an insurmountable obstacle - - the inability to continue needed technical assistance during a forced, seven-month hiatus. The continuing restrictions on the use of short-term technical assistance personnel and a series of administrative delays in securing local currency allotments to be provided under GOS financing with USAID concurrence created a further handicap which the EPM Project has struggled to overcome.

In sum, the EPM Project plainly has suffered from radical shifts in the playing field during its life to date. Without doubt, this external environment has measurably affected the Project's progress in achieving its expected goals and outputs.

Excerpt from 1989 final evaluation.

1. The EPM contributed to the process of economic development in Sudan.

   EPM helped Sudan address, in a generally cost-effective manner, a number of specific pressing energy sector needs. EPM added formal training and valuable on-the-job experience to the staff capabilities of the two counterpart organizations.

   There are clear indications of an overall strengthening of NEA as an institution. There are indications of a strengthening of certain parts of NEC, notably the Computer Center, but also (though more subtly) to other parts of the organization through the encouragement and demonstration of the potential for reform provided for the middle and upper levels of NEC.

2. EPM should be judged a success in terms of its overall goals.

EPM met many of its broader and specific objectives, including the major ones identified by the Mid-Term Evaluation as being actually feasible under the circumstances in Sudan during the time of EPM. Only in comparison with the overall basic problems remaining in the Sudan energy sector and in comparison with the grander goals of the EPM PP could the project be judged unsuccessful.

In terms of the the overall situation, under the most favorable of circumstances EPM could not have turned around the situation in the energy sector as a whole. As the Mid-Term evaluation emphasized, many of the broader and specific goals for EPM as listed in the Logframe of the PP were simply unrealistic and virtually unattainable through the planned activities of EPM.

3. EPM demonstrated that Technical Assistance such as that provided by EPM can have highly cost-effective impacts on the counterpart organizations.

This assistance directly lead to tripling of NEC revenues within three years. At the 1989 exchange rate the annual added revenue to NEC of 50 million Sudanese pounds is worth over $4 million US per year. The benefits to Sudan in monetary terms of the assistance to NEA is more difficult to directly quantify, but even a moderate influence which NEA might exert on a single large energy sector project could easily have benefits exceeding the roughly $2 million devoted to NEA under EPM. Although a careful review of the impacts of the specific NEA activities over the course of EPM is beyond the scope of this review, it seems likely that significant quantifiable impacts would be identified through such an effort.

4. The impact of EPM in-country activities was considerably increased through the formal training courses offered in the U.S., Egypt, and elsewhere.

One potentially major benefit of the formal course, particularly those involving a period of months in the U.S., is the opportunity this provides for the person receiving the training to learn not just the specific technical material, but also to be exposed to the more basic approaches to problem solving, identification of issues, and decision-making.

5. Projects with budgets of several million dollars and a LOP of several years can have important benefits, but except under the most fortunate of circumstances, such projects cannot by themselves entirely build or largely rebuild a counterpart organization.