PD-ARB-351

PROJECT ASSISTANCE COMPLETION REPORT

Project Title:	St. Lucia Geothermal
Project Number:	538-0137
Funding Period:	08/14/85 - 08/31/87
LOP Funding:	ESF Grant $3,000,000 Increased to $4,000,000
Implementing Agency:	Government of St. Lucia
PACD:	Original 08/31/87; Revised 08/31/88

1. Project Purpose

The purpose of the project was to establish the economic and technical viability of the Qualibou Caldera as a long-term geothermal resource capable of generating substantial quantities of electrical and other power which can be developed by the private sector. This was accomplished by a deep well drilling program. Originally the drilling program planned for 3 wells. However due to budgetary constraints this was reduced to two wells.

2. Background

Developmental Problem

St. Lucia's economy is based on agriculture, tourism and increasingly on light manufacturing. Further development of the island's economy depended in part on the improvement of its physical infrastructure, and in particular on the development of a dependable source of electricity. The national electric utility, LUCELEC was entirely based on diesel power. At the time this project was being proposed by the GOSL, the diesel units were reaching the end of their economic life. It should be noted that with the exception of geothermal power, St. Lucia has no indigenous source of power. In view of the price variations of fossil fuels, the Government of St. Lucia embarked on an exploration program of geothermal power. Several studies were carried out resulting in a shallow well drilling program by the British Overseas Development Agency. This drilling program concluded that a deep well drilling program would yield commercial quantities of geothermal power. Other studies were then carried out including a study by the Los Alamos National Laboratory (LANL) of New Mexico which recommended a deep well drilling program at three sites, Belfond, Etangs and Sulphur Springs.

Project Funding

The St. Lucia Geothermal Project was authorized on August 14, 1985 at $3.0 million in ESF grant funds. The PACD was set for August 31, 1987. At the beginning of the project, other contributions were set at $2,380,000 from the U.N. and $80,000 from the Government of St. Lucia. On June 29, 1987, AID's contribution was raised by $1.0 million to $4.0 million and other contributions were raised to $3,115,500 from the U.N. and $600,000 from the GOSL. The PACD was extended to August 31, 1988. At the end of the project all funds were expended and, in fact, the GOSL claimed that it had expended about $825,000.

3. Outputs

Planned Outputs

1. Three geothermal wells drilled, tested and capped.
2. Assurance of environmental safety.
3. The setting up of a private geothermal corporation.
4. The establishment of a power supply agreement between the private geothermal corporation and LUCELEC (the local electricity company).

Achieved Outputs

1. Two geothermal wells were drilled tested and capped. These wells established the location of the geothermal resource.
2. Environmental safety was assured by an environmental awareness safety program that operated throughout the life of the project.
3. The GOSL signed an agreement with LUCELEC (in which the Government is a minority shareholder) to develop the geothermal field.
4. Lucelec's development agreement includes power supply.

It should be noted that prior to this Drilling Program the certainity of St. Lucia's Geothermal Resource had not been proved. This Drilling Program not only established the certainity of the resource but also identified the area.

4. Lessons Learned

Lesson No. 1 - Discussion

This project was AID's first geothermal project. As a result there was very little if any in-house experience in the management of such a project. Given the developmental problem, i.e., that St. Lucia had no indigenous power source except geothermal and that fossil fuel costs were relatively high, it was decided that RDO/C could get involved with this project provided the necessary funds and technical expertise were available. The Los Alamos National Laboratory claimed that it had the necessary technical expertise, and with the assistance of TDP, carried out an evaluation of the geothermal resource that included a sophisticated resistivity survey. Los Alamos then recommended the exploration of three sites, Belfond, Etangs and Sulphur Springs.

The Government of St. Lucia (GOSL) analyzed the advantages to St. Lucia of Geothermal power on the basis of the oil crisis of the 1970s and the future implications (financial technical etc.) of thermal power and became convinced that geothermal power was a viable way forward.

Based on this conviction the Government of St. Lucia lobbied strongly for the project and the involvement of the United Nations Development Program (UNDP) in the project. After several meetings RDO/C joined the GOSL and the UNDP in a project that investigated the economic and technical viability of the Qualibou Caldera as a long-term geothermal resource.

The funding of the project was divided into three sections:

1. Funds for management of the project - UNDP.
2. Funds for the drilling program - USAID.
3. Funds for infrastructure work - GOSL.

The UNDP managed its part of the project through one of its divisions, the United Nations Revolving Fund for Natural Resources Exploration (UNRFNRE). At the beginning of the project a problem arose that was never solved. The UNRFNRE's project manager was removed from the project due to a disagreement between this person and the GOSL. It was realized at the time that this person was very important to the project since he had been heavily involved in its conceptualization, including the preparation of the project budget. RDO/C attempted to have him reinstated by informal means, but this did not materialize. He was replaced by a contractor who was unable to address the various management problems that arose during the project. Finally this contractor's services expired and the project did not have a manager until the final months when another contractor was recruited by the UNRFNRE. This person, too, did not remain until the end of the project. This problem was the single most serious issue throughout the project and affected and caused several other problems, including financial problems during the project.

Lesson No. 1

RDO/C was very concerned when the project manager was removed. However, due to protocol issues this concern was not formally addressed to a conclusion that was satisfactory to RDO/C. In retrospect, RDO/C would have saved itself a lot of trouble by formally informing all parties that, unless the problem was solved to RDO/C's satisfaction, RDO/C would pull out of the project.

Lesson No. 2 - Discussion

The consultants to the project, an Italian firm, were appointed by the UNRFNRE. There was some controversy with respect to this appointment. However, the UNRFNRE refused to change its mind on the grounds that all procurement procedures had been followed. Since RDO/C funded the drilling contract, the drilling contractors were from the U.S. While the UNRFNRE's role at least at the beginning of the drilling contract was defined as "superintending engineer" (resident engineer to the contract), the role of the consultants was never defined. RDO/C was never even given a copy of the contract until much later in the project and only after several requests. This resulted in a lot of confusion with respect to roles, as the consultants acted with direct responsibility on several occasions and no responsibility on others. This, in turn, caused serious management problems. In addition, the UNRFNRE changed its mind with respect to its role during the drilling program. This affected the program seriously.

Lesson No. 2

RDO/C was very concerned about this issue and addressed several letters and cables to the UNRFNRE. In restrospect RDO/C should, at the beginning of the project, have insisted on a clear definition of roles by the UNRFNRE, even though it may have meant having a serious disagreement with the UNDP.

Lesson No. 3 - Discussion

RDO/C hired a contractor from the Los Alamos National Laboratory to write the drilling specifications for the drilling program. However the wording of the specifications was not clear in certain areas. This was due to the contractor not being fully knowledgeable with respect to the type of geothermal drilling that was applicable to St. Lucia (wet well as opposed to dry well drilling etc.). Prior to sending out requests for bids for well drilling, RDO/C devoted a considerable amount of time on the academics of the program. After the project started, it was felt that RDO/C should have given more time to developing the practical components of the program such as finding out about types of geothermal wells, geothermal drilling, issues concerning geothermal drilling rigs, geothermal well developers and operators, transportation, etc.

Lesson No. 3

RDO/C realized these problems early on in the project and solved them. However, the budget had to be revised. Also RDO/C picked up issues concerning the specifications very early and solved them. However, more research at the beginning into the practicalities of implementing this project would have saved RDO/C a lot of problems.

Lesson No. 4 - Discussion

When this project was being planned, assumptions were made that infrastructure work such as road realignment, landing and loading requirements (jetties etc.), construction of drilling pads, water supply, etc., could be carried out in St. Lucia, by the Ministry of Communications & Works or by private contractor. While this was the case, no investigations were made as to speed of construction and cost. Also the transportation of the drilling rig and other equipment to the drilling area was not fully considered by any of the parties involved in the project. Even the consultants appointed by the UNRFNRE did not fully address this issue. RDO/C concluded that the UNRFNRE (the more knowledgeable partner in the project and the one responsible for management) would address these issues. However, this was not done and RDO/C found itself in the middle of a dispute between the drilling contractor, the consultants and the GOSL. In the end, the UNRFNRE disclaimed that it or its contractor had any responsibility for infrastructure work, and the GOSL which was the least qualified of all the parties, was left with the responsibility of resolving the issue. In the best interests of the project, RDO/C helped the GOSL to resolve the problems.

Lesson No. 4

RDO/C realized that the UNRFNRE or its consultants had not addressed issues concerning infrastructure works when the project had passed the initial phase. This was due to an assumption that RDO/C made that the UNRFNRE would manage the project efficiently.