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Report No. 13682

PROJECT COMPLETION REPORT

ARGENTINA

**POWER ENGINEERING PROJECT
(LOAN 2751-AR)**

NOVEMBER 4, 1994

Infrastructure and Energy Operations Division
Country Department IV
Latin America and the Caribbean Regional Office

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CURRENCY EQUIVALENTS

Currency Unit - Peso

EXCHANGE RATE

P\$1 = US\$1

WEIGHTS AND MEASURES

Metric System

FISCAL YEAR

January 1 - December 31

ABBREVIATIONS AND ACRONYMS

EdF	-	Electricité de France
ENEL	-	Ente Nazionale per l'Energia Electrica
IDB	-	Inter-American Development Bank
ERR	-	Economic Rate of Return
SE	-	Secretariat of Energy
SEGBA	-	Servicos Eléctricos del Gran Buenos Aires

THE WORLD BANK
Washington, D.C. 20433
U.S.A.

Office of Director-General
Operations Evaluation

November 4, 1994

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

**SUBJECT: Project Completion Report on Argentina
Power Engineering Project (Loan 2751-AR)**

Attached is the Project Completion Report on Argentina - Power Engineering Project (Loan 2751-AR). The PCR was prepared by the Latin America & the Caribbean Regional Office. The Borrower contributed Part II of the PCR.

The project objective was to assist the Government in implementing measures to improve the efficiency of electricity distribution by providing the utilities with modern methodologies and supporting equipment for planning and design of the distribution system.

The objective was fully met by successfully carrying out: (a) a set of studies on sectoral matters (reorganization of distribution systems, regulation of concessions, procurement, and uniform system of accounts), quality of services (reliability, customer services, customer attitudes), engineering planning (methodologies for least-cost expansion and rehabilitation, loss reductions) and operational planning (reporting, accounting and budget control, procurement, inventory and warehouse management); (b) a metering program (analysis of load curve, design of tariffs, demand side management studies); and (c) a training program (fellowships, on-the-job training and expatriate trainers). Given the high cost of distribution, the focus on efficiency was highly relevant and proved essential at project completion when the privatization of distribution companies began.

The project cost of US\$21.5 million (13% higher than estimated at appraisal) was financed by the US\$14.0 million Bank loan and US\$7.5 million contributed by the Government and participating utilities. The loan was fully disbursed in June 1993, one year behind schedule.

The project outcome is rated as highly satisfactory and its institutional development impact as substantial. Since the enhanced skill base created by the project and its supporting modern tools remain in the utilities being now privatized, the sustainability of the project benefits is rated as likely.

The PCR contains an excellent account of the project implementation and results. No audit is planned.

Attachment



PROJECT COMPLETION REPORT

ARGENTINA

POWER ENGINEERING PROJECT
(LOAN 2751-AR)

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PROJECT COMPLETION REPORT

ARGENTINA

**POWER ENGINEERING PROJECT
(LOAN 2751-AR)**

PREFACE

This is the Project Completion Report (PCR) for the Power Engineering Project in Argentina, for which Loan 2751-AR in the amount of US\$14.0 million equivalent was approved on September 1986. The Borrower was represented by the Secretariat of Energy (SE) within the Ministry of Public Works and Services. The Loan was closed in June 1993, one year behind schedule. It was fully disbursed with the last disbursement in June 1993.

Parts I and III of the PCR were prepared by the Infrastructure and Energy Division, Country Department IV, of Latin America and the Caribbean Regional Office and are based, *inter alia*, on the combined President's/Staff Appraisal Report; the Loan and Guarantee Agreements; supervision reports; correspondence between the World Bank (Bank) and the Borrower; and internal Bank memoranda. Part II of the report was prepared by the Borrower and is a translation of a letter covering the SE's review of the project, dated June 10, 1994.

PROJECT COMPLETION REPORT

ARGENTINA

POWER ENGINEERING PROJECT (LOAN 2751-AR)

EVALUATION SUMMARY

Project Objectives

1. The objective of the project was to assist the Government in implementing measures to improve the conditions of electricity distribution in the country by providing the beneficiaries with modern methodologies and supporting equipment to improve their distribution planning and design (para. 3.1).

Implementation Experience

2. The scheduled completion date for the project was June 30, 1992. However, the actual completion date was June 30, 1993, one year behind schedule. The project was essentially completed before the originally agreed date, but the actual completion date was extended to allow acquisition of special equipment needed to complete a survey (para. 4.2).

Project Results

3. The objectives of the project were met. The project made an important contribution to the power sector by assisting the Government in identifying and addressing some key organizational, functional and technical problems which impeded the coordinated and efficient development of distribution facilities. Another project achievement was that it provided the most important distribution utilities in the country with modern equipment, computer hardware and software, and methodologies to improve their planning and design capabilities (para. 5.1).

4. In addition, other non-participating utilities benefited from this project, since the results of the studies and other knowledge developed were transferred to them. Also, the studies provided the Government with a sound source of information for the privatization of *Servicios Eléctricos del Gran Buenos Aires* (SEGBA) (para. 5.4 & 5.14).

Sustainability

5. This project assisted in the training of over 150 people in the different utilities, and equipped the participants with technologies and know-how that the sector was lacking. Further, the project provided the basis for systematically updated sector expansion plans, currently being implemented. The project also slowed, and in several cases reversed, the technical deterioration of the provincial utilities, creating better conditions for a successful privatization process (para. 5.7).

Lessons Learned

6. At appraisal the Bank correctly identified that difficulties in coordination between the SE and the provincial utilities could jeopardize the success of the project. To deal with this situation, the Bank requested as a condition of effectiveness a commitment from the provincial utilities covering their obligations for the project implementation. If this condition had not been set in advance, it would have been very difficult, perhaps impossible, for the SE to make the utilities follow any instructions, since these utilities are autonomous. It is also important to highlight the important role that the team work had in the successful implementation of this project. The project participants went beyond merely fulfilling a loan condition and worked towards making the project a success (para. 5.10).

PROJECT COMPLETION REPORT

ARGENTINA

POWER ENGINEERING PROJECT (LOAN 2751-AR)

PART I: MAIN FINDINGS AND LESSONS LEARNED BY THE BANK

1. Project Identity

<u>Project Name</u>	Power Engineering Project
<u>Loan Number</u>	2751-AR
<u>RVP Unit</u>	Latin America and the Caribbean Regional Office
<u>Country</u>	Argentina
<u>Sector</u>	Energy
<u>Subsector</u>	Electric Power

2. Background

2.1 At the time that this project was identified, the World Bank's lending strategy in Argentina was directed toward helping the country achieve sustained medium-term growth, reduce its debt-to-export ratio, and attain a modest increase in per capita consumption. The lending program was focused upon: (a) technical assistance to strengthen the Government's analytical and administrative ability to design and implement economic reform programs; (b) financial assistance to support the process of structural reform and growth; and (c) playing a catalytic role in increasing external resource flows. Within this context, one of the Bank's lending priorities was energy development. In the area of oil and gas development, the objective was: to support the Government in rationalizing the scope of private sector development; to clarify the roles of public and private enterprises with a view to enhancing the efficiency of resource use; and to establish financing mechanisms to reduce demands on the budget, expand production and reserves, and substitute relatively abundant natural gas for liquid fuels. With respect to electrical power, the objective was to ensure adequate and reliable power supply, minimize costs by reducing the levels of energy loss, restore satisfactory self-financing capacity, overcome the uneven access to electricity service while improving its quality, and improve sector organization and institutional relationships.

2.2 Argentina's energy resources are diverse and abundant. However, for many years the country's policies did not foster efficient use of these resources. For example, during the period 1973-83, the country's total energy consumption grew 26% while GDP grew 3%. The main cause for this problem was attributed to distorted pricing policies, since for some time the Government allowed prices of oil derivatives and electricity to decrease in real terms. Further, the structures of electricity tariffs did not promote conservation because the tariffs were affected by regional preferences and cross-subsidization.

2.3 To have a better understanding of the sector problems it is important to know that the Federal Government and the Provincial Governments owned all electrical generation, transmission and distribution facilities in Argentina. However, the sector's organization was fragmented. Generation and transmission expansion was based on centralized planning, financed with taxes on fuels and electricity bills, and executed by federally owned utilities. The decisions, however, were not always based on minimum cost solutions. Moreover, financing was seldom guaranteed for projects prior to implementation and execution capacity was uneven. In general, the financial situation of the federal utilities was weak because the energy taxes collected to help the expansion could not make up for the financial gaps caused by insufficient tariffs. Making matters worse, responsibilities for policies and regulations of distribution were divided among several federal and provincial entities. On the other hand, the provinces' constitutional autonomy enabled them to grant concessions for distribution services. The provinces could set the financial rules and tariffs for the operation of the facilities, without the obligation to maintain specific standards of service or providing data to the Government.

2.4 The Government was aware of the sector problems and was seeking to improve resource allocation within the sector through optimization of the sector's expansion programs and improved coordination of operations. **This project was the first step towards the Government's broad-based effort to improve the efficiency of Argentina's regional power distribution system.** This was to be accomplished by strengthening coordination between the national and the provincial utilities and increasing the efficiency of the latter. The efforts to be pursued by the Government included:

- (a) countrywide regulations which would assure even coverage and quality of service;
- (b) improved planning methods and tools to optimize allocation of resources; and

- (c) **standardization of methods and systems for operating the networks to promote efficiency in the utilities' operations as well as system coordination and integration.**

2.5 This project, although small, represented a significant expansion in the Bank's involvement in the institutional development of the power sector and contributed to a more active dialogue among the Bank, the Government and the provincial utilities regarding specific policy reforms needed to improve the sector.

3. Project Objective and Description

3.1 The main objective of the Power Engineering Project was to assist the Government in implementing measures to improve electricity distribution in the country by providing the beneficiaries with modern methodologies and supporting equipment to improve their distribution planning and design capability.

3.2 The project consisted of:

- (a) **four distribution studies oriented towards:**
 - (i) **improving the sector organization and coordination for distribution of electricity;**
 - (ii) **evaluating the quality and reliability of electricity service and the origin and level of losses;**
 - (iii) **designing and implementing methodologies for least-cost planning and defining standards for materials and equipment; and**
 - (iv) **recommending procedures to improve the utilities operational planning, budgeting and inventory control.**
- (b) **a metering program designed to improve data for studies under (a) above and to improve system expansion planning, rate design and billing;**
- (c) **a training program which included fellowships, courses and arrangements with foreign distribution companies for on-the-job-training.**

4. Project Origins and Implementation

4.1 This project evolved from discussions with the Argentine authorities regarding the high level of investments required for expanding distribution networks and the need to improve the quality and efficiency of distribution services from a national perspective. Appraisal of the project took place in December 1985, negotiations in July 1986, and loan signature in June 1987. The delay in loan signature was mainly due to bureaucratic inefficiency, especially with respect to procedures for loan approval by the Government and by the interest of the Government in only signing the loan after agreements had been formally reached with all the provinces participating in the project. The latter process started only after the Bank approved the loan in September 1986.

4.2 Although this loan was signed in June 1987, its execution started in March 1987 with the structuring of seven working groups composed of professionals seconded by the participating utilities and several external consultants. At the beginning the project had a slow pace due to the time spent bringing all the professionals seconded by the utilities together, as well as preparing and agreeing on detailed terms of references for the different groups. By the end of September 1987, most of the consultants had been contracted and the seconded staff was in place. The original closing date of this loan was June 30, 1992, however, the closing date was extended one year. This delay was necessary to allow for the acquisition of specific equipment to carry out the load curve survey for residential customers. This survey was very important and was to be conducted at a later date by the participating utilities. The data obtained from this residential survey, in addition to the industrial customer survey carried out by the project, would improve the knowledge of the system characteristics and thus the quality of planning and design of the network; therefore it was imperative for the utilities to obtain this equipment. As Table 5, Part III shows, there were considerable delays in the completion of the different project components. The delays in most of the cases were due to the organizational difficulties at the project start, the complexity of the studies that had to be carried out, and procurement of computer hardware/software and other equipment. In retrospect, the target dates proved to be too optimistic.

4.3 The execution of the project was the responsibility of the Ministry of Public Works and Services, through the SE. An *ad hoc* Executing Unit was created in the SE to implement the project with technical assistance and participation of staff from the power utilities and with external support from consultants. This approach was considered desirable in order to obtain the direct involvement of the utilities in the studies and their successful implementation. The national utilities participating in the project were SEGBA and AyE, and the provincial utilities were ESEBA, formerly DEBA (Province

of Buenos Aires), EPEC (Córdoba), DPESF (Santa Fe) and EMSE (Mendoza) which are the largest distribution utilities.

4.4 In order to ensure adequate participation and collaboration of the participating utilities, the SE was requested to enter into agreements (acceptable to the Bank) with the participating utilities, which spelled out their responsibilities and obligations regarding the following issues: (a) staffing of the Executing Unit; (b) transfer of metering equipment; (c) training program; (d) information dissemination; and (e) results of the studies. The execution of these agreements was a condition of effectiveness for the project.

4.5 **The Distribution Studies.** The first project component consisted of four sets of distribution studies. The first set of studies was on **sectoral matters**, and it analyzed the organization and regulations governing the distribution utilities and made recommendations for improving their efficiency. This set of studies covered: (a) the organization of distribution services and planning and possible improvements in the use of resources; (b) the existing and required regulations governing concessions; (c) the methods for acquiring and processing information and current reporting procedures; and (d) the accounting procedures and the design of a uniform system of accounts that could be used by the entire sector as the basis for budgeting, planning, statistics, financial control and forecasts.

4.6 The second set of studies, **quality of service**, assessed the impact of investment restrictions on the system's reliability, the level and origin of losses, and recommended goals for improving distributions reliability. This set of studies covered: (a) past and current quality of service and the impact of investment restrictions on the quality of service; (b) customer attitudes regarding the quality and cost of services and their willingness to pay; (c) goals for quality of service at the distribution level and the impact of different reliability levels; and (d) recommendations for improving the quality of service.

4.7 The third group of studies, **engineering planning**, designed and implemented methodologies for least-cost planning and standards for materials and equipment as well as prepared a five year rehabilitation, expansion and loss reduction plan for the provincial utilities. This set of studies covered: (a) the operational conditions of major distribution facilities; (b) current methodologies for distribution planning and recommendations for resource allocation; (c) a global medium-term plan for rehabilitation and expansion of networks; (d) technical standards for equipment and materials, and supply capacity of the national industry; (e) origin and levels of distribution losses and action plans for reduction; and (f) identification of areas suitable for applying the recommendations of the study and the design of a pilot program.

4.8 The final set of studies, **operational planning**, covered: (a) development and implementation of procedures for short-term planning of works; (b) reporting, accounting and budget control; (c) programming and purchasing equipment and materials; (d) inventory control and stores management; and (e) stores management training needs.

4.9 **The Metering Program.** The second project component was the metering program which dealt with the inaccuracy of data on the consumption patterns for the various classes of consumers and the lack of reliable measurements of losses on the distribution systems, which in turn presented constraints in improving the conditions of distribution systems in the country. The objectives of this program were:

- (a) to prepare a data base showing consumer demand and distribution systems load characteristics for the purpose of improving the methods used in planning distribution networks;
- (b) to develop rational tariff policies and advance rate designs (time-of-day tariffs) using the data base developed in (a) above;
- (c) to acquire metering equipment to improve billing and metering procedures; and
- (d) to use the metering equipment to design and carry out programs for direct and indirect load control.

4.10 The third project component was a **training program**. The objective of the program was to help the SE and the utilities in ensuring that the project had adequate support from qualified staff. This training program included fellowships for professionals from the utilities to study abroad, for the contracting of foreign experts to conduct training in Argentina, and for foreign distribution utilities to provide on-the-job-training.

4.11 **Project Cost.** The estimated cost of the project at appraisal was US\$21.5 million, of which US\$14.0 million was to be financed by the Bank. The US\$14.0 million were intended to finance all the foreign exchange costs. The local costs would be financed by the Government and participating utilities. The actual cost of the project was US\$24.3 million (Table 6, Part III). The difference in the projected and actual costs was in large part due to higher subsistence expenses for the participating utilities' staff, due both to the higher number of staff and the extended duration of their stay in Buenos Aires. The results of the studies as well as the equipment purchases were transferred to the participating utilities as a contribution of the Government to the sector.

4.12 Disbursements. The loan's estimated and actual disbursements (Table 3, Part III) reflect that at the beginning the project had a slow start, yet after the third year, the disbursements followed closely the profile projected during project appraisal. The original closing date was June 30, 1992, however, the project was extended until June 30, 1993 (para. 4.2). The last disbursement was on June 1, 1993.

5. Project Results

5.1 Meeting Project Objectives. All the project objectives were met. This project made an important contribution to the power sector by assisting the Government in identifying and addressing key organizational, functional and technical problems which impeded the coordinated and efficient development of distribution facilities. The completion of the different studies provided the Government and the utilities with a wealth of knowledge on the sector such as: information on the quality of service, the operational conditions of the major distribution facilities, homogenization of technical standards, as well as detailed procedures and other data very useful for budgeting, planning, statistics, financial control, etc. As a consequence of this project, the Borrower was able to improve the use and development of distribution facilities in the power sector. Another project achievement was that it provided the most important distribution utilities in the country with modern equipment, computer hardware and software, and state-of-the-art methodologies to improve their planning and design capabilities.

5.2 One example of an important development achieved by the project was the improvement of the software PRAO, created by *Electricité de France* (EdF), the project's main foreign consultant, in order to deal with the expansion of aerial distribution systems. It became a very powerful interactive tool for system expansion studies and decision-making. This product has been transferred to the non-participating utilities which have been using it, among other classical applications, for studying the compensation of long feeders in rural systems.

5.3 With the help of the project, the SE was able to incorporate two powerful computing tools for the optimum dispatch of the national generation system. While this development was not among the initial project objectives, given the extremely difficult supply situation in 1988, the Bank agreed with the request of the SE to use project resources for developing the computer programs, which proved very useful in helping to minimize the generation curtailments that occurred in 1988 and 1989.

5.4 All aspects contemplated in the project studies and activities (paras. 4.5-4.10) were carried out with a high degree of quality. In addition, other non-participating utilities benefited from this project, since the results of the studies and other knowledge developed were transferred to them. Finally, this project also served as input to subsequent sector work done directly with the provincial utilities by the Inter-American Development Bank (IDB). In fact, the IDB Loan Agreement for the provincial distribution investment loan established that the methodology developed in the Power Engineering Project should be used for prioritizing the investments included in the expansion plans.

5.5 **Financial Performance.** This project financed 100% of the foreign expenditures and the consultants services, therefore minimizing the counterpart funds requirements to the Borrower. The participating utilities covered the costs of living for their personnel in Buenos Aires. There were no counterpart funds issues. It is important to mention, that due to the nature of the project, the Bank did not attempt to include in the Loan Agreement typical financial covenants for the envisaged participating utilities or for the sector as a whole. Table 7, Part III shows that the Borrower was responsible in keeping project accounts up to date and provided the Bank with the necessary project documentation as requested in the Loan Agreement, although there were some delays of audit reports. The economic rate of return (ERR) was not calculated due to the nature of the project which mainly financed studies and training.

5.6 **Project Impact.** This project helped the Government to get a clear idea of the magnitude of the sector problems at the time. It also helped to open the dialogue between the Government and the provinces regarding the power sector. Originally, it was anticipated that this project was going to serve as the basis for a Second Electric Power Sector project, which would finance the distribution investment priorities identified for the provincial utilities. However, the overall situation of the power sector in the country—particularly the financial situation—had deteriorated so much that it forced the Bank to abandon the idea of a second sector project. Instead, the Bank decided to concentrate its efforts on completing the Yacyretá hydroelectric plant rather than starting new operations in a sector that was full of uncertainties. It is also worth noting that all studies on corporate organization, tariffs, investment and service quality were actively used by the SE as a solid and prompt source of information during the privatization process of SEGBA.

5.7 **Project Sustainability.** This project assisted in the training of over 150 people in the different utilities, equipping the participants with technologies and know-how that the sector was lacking. In addition, this project paved the way for the establishment of sector expansion plans, systematically updated, which are currently under execution. The project also slowed and reversed in some

cases, the technical deterioration of the provincial utilities, creating better conditions for a successful privatization process. However, the sustainability of the improvements will diminish if the provincial utilities do not maintain trained personnel in their functional specialties.

5.8 Bank Performance. Processing of this loan proceeded smoothly with the Bank providing significant assistance to the Argentines whenever needed. The project absorbed a total of 62.0 staff weeks of which 34.5 were allocated to project preparation, appraisal and negotiations (Table 8, Part III). The project was supervised about once a year. The number of supervision missions was adequate with good coverage, and advantage was taken of other projects' supervision missions to supervise this project as well.

5.9 In general the Bank's performance was highly satisfactory. Even though the sector had a lot of problems, the Bank's decision to keep this project simple was of great help. This project clearly allowed the Bank to open the channels of communication among the different utilities and the Government, and more important, provided all the parties involved with the necessary data to start dealing with the problems identified.

5.10 Lessons Learned. At appraisal the Bank correctly identified the difficulties in coordination between the SE and the provincial utilities that could jeopardize the success of the project. To deal with this situation, the Bank requested as a condition for effectiveness a commitment from the provincial utilities regarding obligations¹ for the project implementation. This condition was actually met prior to loan signing (para. 4.1). If this condition had not been set in advance, it would have been very difficult, perhaps impossible, for the SE to make the utilities to follow any instructions, since these utilities are autonomous. It is also important to highlight the important role that team work had in the successful implementation of this project. The participants went beyond merely fulfilling a loan condition and really worked towards making the project a success.

5.11 Borrower Performance. SE's and the provincial utilities' performance during the execution of the project was very good. During appraisal the need to seek cooperation of the provincial utilities was discussed as a key factor for the successful completion of this project. The fact is that there was a spirit of

1. In order for the Loan to become effective the Bank requested in section 6.01(a) of the Loan Agreement that "the Borrower entered into agreements, satisfactory to the Bank, with each one of the Participating Utilities; such agreements should provide, *inter alia*, that each one of the Participating Utilities performed the obligations and duties set forth in the Schedule 6 to the Loan Agreement."

cooperation among all the parties involved, and this made for successful project execution. Although there was some lack of experience and knowledge in terms of how the Bank does business (procurement, etc.), the project moved along rather smoothly.

5.12 The Borrower fulfilled all the conditions specified in the Loan Agreement (Table 7, Part III), and the utilities provided the qualified professionals to staff the Executing Unit. In addition, SEGBA provided administrative support to the project. All the utilities participated in the training component, and professionals were granted the necessary leave to attend the training programs. Also, the utilities organized and implemented programs for the internal dissemination and teaching of the knowledge and skills acquired by the staff that participated in the training programs. Finally, the information generated by the studies was shared not only with all parties originally involved in the project, but also with some utilities that were not part of the project.

5.13 The completion of the quality of service study, which included a **customer service pilot program** in SEGBA, faced some implementation difficulties due to labor problems in SEGBA. Basically, the labor union was opposed to the operation of the Customer Service Pilot Union because it was seen as a challenge to the rigid use of staff according to their established functional classification. However, this problem was taken care of shortly after the Bank was informed of the situation, and no Bank action was needed.

5.14 It was envisioned that SEGBA, as the leading utility in the country, would apply the results of the project to its operation, as they became available. Even though some SEGBA staff were key participants in the project, they never succeeded in changing the bureaucratic, "reaction to change" mentality of the intermediate ranks of SEGBA's management, or mobilizing the upper management, which had been subject to frequent turns-overs. The Bank, whose fifth distribution and transmission project with SEGBA was developed almost simultaneously with the Engineering Loan, was not any more successful with SEGBA than the Government. In fact, the acute signs of its deterioration as a utility was one of the reasons the Government chose to start the privatization of the power sector with SEGBA.

5.15 **Relations with the Borrower.** The Bank's relationship with the Government and the beneficiaries during the project implementation period was very good. As mentioned in para 5.3, good understanding between the Bank and the SE allowed the use of the project resources in a wider perspective, during the generation supply crisis of 1988. During project execution, there was a change of Government, which caused some changes in the project administration. However, the same spirit of cooperation remained among the

SE, the utilities and the Bank. About 70% of the project objectives were met during the first administration and the remaining 30% during the second administration.

5.16 Consultants Services. The majority of the consultant services were provided by an Argentine consortium (DISTRELEC), which allowed for the development of the local consultants. Their capable performance was essential for the project's success. Also, two important European utilities, EdF (France) and ENEL (Italy), provided consulting services to the Argentines during the execution of the project. The use of these consultants facilitated the application of international methodologies to the sector and left the provinces with up-to-date knowledge.

5.17 Procurement. The implementation of this project confronted some delays, mostly due to a lack of knowledge of Bank's procurement procedures. Basically, every document submitted to the Bank for its review and approval had to go through several iterations until it was finally approved. Documents that had been already approved by the Bank were not used in future occasions, instead new documents were usually prepared, which produced delays. The procurement of the technical equipment to carry out the load curve survey caused a one year delay on the project closing (para. 4.2). This delay was mostly caused because the equipment that the Argentines were interested in acquiring for the first phase of the survey (industrial customers) was not standard or easy to acquire. For the second phase of the survey (residential customers) the Argentines, after some discussion with the Bank, agreed to use more conventional equipment. This delay might have been avoided if the Bank had opted for not letting the Argentines try too many innovations. However, given the exploratory nature of the work, the Bank took the limited risk of allowing usage of non-standard technologies.

5.18 Project Documentation and Data. The Loan Agreement was adequate for achieving project objectives and the combined President's/Appraisal Report provided a useful framework for the Bank, the Borrower and the utilities in terms of what the sector problems were, which in turn facilitated the project implementation. Also, the supervision reports and the Executing Unit Reports contained enough detail to keep the Bank well informed about the progress of the project. In addition, the audit reports also proved to be a good record of the project evolution. A project library was organized by the Executing Unit, where all reports and major documents produced by the project were kept.

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

Translated from the letter dated June 10, 1994 from Ms. Monica Servant, National Director for Promotion, Secretariat of Energy. The text was edited to increase readability. The original is available in the project files.

The Power Engineering Project started in 1987, but its design was addressed in 1985 — a period during which there was no glimmer of the profound transformation that would take place in Argentina starting in 1989 and in the power sector starting in 1991.

A technical assistance program was outlined for the sector at both the national and provincial levels, and subjects were targeted to give answers to the classic problems of power distribution utilities:

- * Demand forecasts
- * Sales projection
- * Reduction and control of losses
- * Selection of investments
- * Programming of works
- * Service quality
- * Meter readings
- * Rate calculation
- * Standardization and development of suppliers
- * Sectoral aspects (economic-administrative management of the utility)

The final analysis of the project, which the SE ought to make, is to evaluate its real benefits in each segment of activity in the power sector.

Power sector organization has changed, and the old integrated, vertical vision is not possible today. Decisions at the national level — connected with the management modalities of the activity — are no longer political decisions.

Despite the preceding statement, personnel of the participating utilities received a significant training in technical-economic and commercial matters, applicable to the management and legal aspects of their activities.

All the documentation prepared in the Power Engineering Project has been transferred to the National Electricity Regulatory Entity who has organized a library where all the documentation is available to those requiring it. The SE keeps a copy of those documents in magnetic storage.

It is convenient to make a specific review of the applications of the project results, thus:

- * Within the framework of this project and in the context of the responsibilities of EdF, one of the foreign consultants, the optimization models for operation MARGO and OSCAR were developed, around which the technical functions of the Dispatch Center were organized (currently the responsibility of CAMMESA). In this same context, the tools for short-term forecasting, which take into account temperature variations, were also transferred.
- * The methodology to calculate the rate schedule for the new distribution concessionaires in the former territory of SEGBA was prepared based on the developments of this project.
- * Also developed in the project was the model for calculating aggregate distribution costs presently being used by the SE in its advisory support to the provinces for the privatization of their distribution business units.
- * The analysis of service quality defined the parameters for the control of the power distribution concessions which is, more precisely, the evaluation of the service based on technical and commercial quality.
- * The execution of the load surveys in each of the principal markets of the Argentine electrical system will be coordinated in the future by the SE, since it is considered a very useful statistical tool for better evaluating demand evolution.
- * The tools developed to calculate the investments for the expansion of distribution networks (with EdF) and the sub-transmission or regional distribution networks (with ENEL), are already being used by all the participating electrical utilities.

It is necessary to point out some restrictive aspects in the application of the project results which are not due to the modality of implementation adopted, but instead are a product of management instability at the utilities.

- * It was not possible to ensure the maintenance of all staff members in the function for which they had been trained.

- * The load surveys were not totally completed, although the equipment has already been transferred to the intended jurisdictions, and future activity will be coordinated by the SE, as already mentioned.

In short, it may be expressed that the result of the project is positive, from the point of view of the increased technical capacity of the involved staff as well as that of the SE.

PART III: STATISTICAL DATA

Table 1: Related Bank Loans
(US\$ million)

Loan	Purpose	Year of Approval	Principal (US\$ Million)	Status
308-AR	Financing of the Costanera thermal power plant	1962	95.0	Closed
525-AR	Expansion of thermal generation	1968	55.0	Closed
644-AR	Expansion of transmission and distribution systems	1969	60.0	Closed
577-AR	Construction of El Chocón hydroelectric Power plant	1968	82.0	Closed
1330-AR	Construction of SEGBA'S fourth power Plant	1976	115.0	Closed
1761-AR	Construction of the Yacyretá hydroelectric power plant	1980	210.0	Closed
2854-AR	SEGBA V	1988	276.0	Active
2998-AR	Electric Power Sector I	1989	245.0	Closed
3520-AR	Yacyretá II	1992	300.0	Active

**Table 2: Project Timetable
(US\$ million)**

Item	Date Planned	Actual Date
Completion of Preparation	---	September 1985
Appraisal Mission	November 1985	December 1985
Loan Negotiations	April 1986	July 1986
Board Approval	June 1986	September 1986
Loan Signature	July 1986	June 1987
Loan Effectiveness	September 1987	September 1987
Project Completion	December 1991	April 1993
Loan Closing	June 1992	June 1993
Last Disbursement Date	June 1992	June 1993

**Table 3: Cumulative Estimated and Actual Disbursements
(US\$ Millions)**

Fiscal Year	Estimated Cumulative	Actual Cumulative	Actual as % of Estimated
FY 87	1.7	0.0	0.0
FY 88	5.0	3.1	62.0
FY 89	7.8	6.6	84.6
FY 90	10.4	11.0	105.8
FY 91	12.0	13.5	112.5
FY 92	14.0	13.8	98.6
FY 93	14.0	14.0	100.0

**Table 4: Allocation of Loan Proceeds by Category
(US\$)**

Category	Appraisal Estimate	Actual Disbursed
1. Goods	5,698,000	3,669,967
2. Consultants' Services and Training	4,655,000	9,720,493
3. Training	847,000	609,540
4. Unallocated	<u>2,800,000</u>	<u>---</u>
TOTAL	14,000,000	14,000,000

Table 5: Planned And Actual Completion Dates of Components

Project Components	Appraisal	Actual	Months of Delay
1. Sectoral Matters Study	Dec 1987	Dec 1989	24
2. Quality of Service Study	Dec 1987	Dec 1989	24
3. Engineering Planning Study	Dec 1988	Jul 1990	19
4. Operational Planning Study	Mar 1989	Dec 1989	09
5. Metering Program	Jun 1988	Dec 1990 ^a	30
6. Training	Dec 1988	Jul 1989	07

^{a/} Refers to program design. Load surveys were transferred to participating utilities to be carried out after the project closing. Acquisition of the metering equipment was processed the last year of the project's execution and finalized at the project closing (June 1993).

Table 6: Project Cost and Financing
(US\$ Thousands)

Project Components	Appraisal	Actual	% Change
Project Costs			
1. Distribution Studies	6,852	9,691	+22
2. Metering Program ^a	2,292	19	---
3. Training Program	1,330	822	-38
4. Equipment	5,180	3,468	-7
5. Supervision	<u>80</u>	<u>---</u>	---
Sub-Total	15,734	14,000 ^b	-11
Contingencies	5,766	---	---
Counterpart Funds	<u>---</u>	<u>10,273</u>	---
Total Project Cost	21,500	24,273	+13
Project Financing			
Bank	14,000	14,000	0
SE	<u>7,500</u>	<u>10,273</u>	+37
Total Financing	21,500	24,273	+13

a/ The Metering Program costs correspond to foreign consultant costs only.

b/ The actual data by component excludes the local costs.

Table 7: Status of Covenants and Conditions

Loan Agreement	Description	Status of Compliance
3.01(a)	Borrower to carry out the Project through SE, with the assistance of the utilities.	Met
3.01(b)	Borrower to carry out the analyses and studies of the Project in accordance with terms of reference satisfactory to the Bank.	Met, with delays
3.02	The Borrower shall maintain the Executing Unit staffed with personnel satisfactory to the Bank.	Met
3.03(a)	Submit for the Bank's approval the content of each program as well as the schedule of its implementation.	Met
3.03(b)	Select the beneficiaries of the training programs in accordance with criteria satisfactory to the Bank.	Met
3.03(c)	By December 31, to exchange views with the Bank on training programs to be carried out the following year.	Met
3.03(d)	Furnish the Bank the results of each training and the benefits to be derived therefrom.	Met
3.04	Borrower to enter into agreements with the participating utilities.	Met
3.05(a)	The Borrower to request data from utilities.	Met
3.05(b)	The borrower to provide above data to the Bank.	Met
3.06	Procurement of good and consultants according to schedule 4.	Met
3.07	Terms of reference of studies satisfactory to the Bank.	Met
4.01(a)	Adequate records and accounts.	Met
4.01(b)	Auditing Accounts.	Met, with delays in some years
4.01(c)	Provisions of withdrawals on the basis of statements of expenditures.	Met

Table 8: Staff Inputs
(staff weeks)

Bank FY	1985	1986	1987	1988	1989	1990	1992	1993	Total
Preparation	1.3	3.8							5.1
Appraisal		27.1	1.5						28.6
Negotiations				0.8					0.8
Supervision	—	—	0.9	6.5	4.0	13.5	2.6	0.6	27.5
TOTAL	1.3	30.9	2.4	7.3	4.0	13.5	2.6	0.6	62.0

Table 9: Mission Data

Activity	Month/Year	People	Days	Rating	Type of Problems
Appraisal	11-85	3	17		
Supervision I	09-87	3	10	1	None
Supervision II	11-88		19	1	Implementation delays of customer service pilot program
Supervision III	06-89	1	19	1,2	None
Supervision IV	12-89	1	10	1	Overdue audit reports
Supervision V	06-90	1	12	1,2	Problems complying with Legal Covenants.
Supervision VI	08-91	1	7	1	Overdue Fin. Stmtns. & Project Accounts & Special Account Audits
Supervision VII	06-92	2	10	1	Delay in the acquisition of residential load survey equipment

October 27, 1994