

TECHNICAL TRAINING FOR THE ELECTRONICS INDUSTRY

(TC-95-05-36)

EXECUTIVE SUMMARY

EXECUTING AGENCY: Camara Nacional de la Industria Electronica (CANIECE)

RECIPIENTS: CANIECE member firms, engineers, supervisors, technicians and factory staff of electronics firms.

OBJECTIVES: The overall objective of the project is to promote the competitiveness of strategic segments of the electronics industry, by testing innovative financing mechanisms that will allow member firms to introduce state of the art technologies in Mexico.

Specific objectives are to (i) transfer technical know-how through external training and industry benchmarking in strategic technologies not available in Mexico; (ii) introduce specialized enterprise-based or association-sponsored training strategies for engineers, technicians and other industry workers; (iii) strengthen the institutional capacity of CANIECE to manage and sustain the training program; and (iv) test the effectiveness of the pilot training and financing mechanisms.

DESCRIPTION: The proposed three year project is designed to assist the electronics industry in responding to skill needs through specialized, enterprise-based training. Participating firms and workers will gain technical know-how, training, practical experience with state-of-the-art production methods, and access to new technologies in their area of specialization. The project will have the dual effect of involving employers in training program design to ensure that the training is tailored to meet industry needs. The project is intended to become a self-sustaining program to train manufacturing engineers and technicians from CANIECE member companies through the establishment of a revolving training fund. The training fund is a financial mechanism to recuperate costs of the overseas and in-country training sponsored by CANIECE.

To achieve its objectives the project will consist of three components: transfer of international know-how and industry benchmarking, specialized enterprise-

based training, and institution-building and training promotion.

The first component will support participant access to highly specialized training and technologies not available in Mexico. The project will develop a test case to examine the design of the proposed training mechanism. The training activity for the test case will involve sending engineers and technicians from selected Mexican firms abroad for an estimated 12 months to gain knowledge and experience necessary to manage automated production.

The training activity specifically will involve the transfer of technical know-how to manage the manufacture of smart sensors. This test case has been identified based on the survey CANIECE conducted (paragraph 2.8) and on discussions the Association has had with several of its members that presently have the capability to design and manage manual assembly of certain simple models of sensors. Over a three year period, it is anticipated that 12 engineers and/or technicians will need to receive training in the test case to achieve the desired transfer of technology and impact. As a partnering arrangement has already been established between a Mexican company and a Japanese sensor manufacturer, in the first year of project implementation, four engineers and/or technicians will receive training in Japan. Additional partnering arrangements with international sensor producing firms will be identified by CANIECE during the first year of project execution for the remaining eight engineers and/or technicians included in the test case.

The specific objectives of training proposed in the test case are to: (i) upgrade and expand the skills and knowledge of Mexican engineers in microchip assembly, surface mount technology, numerically controlled machining, quality control, and other related areas; (ii) provide participants with the necessary knowledge and skills needed to adapt to technological innovation and new work processes as these are introduced into the workplace; and (iii) increase the engineers' ability to contribute to the productivity of the enterprise where they function.

The second component will finance in-country training to support the introduction of specialized technologies not available in Mexico. Two types of modalities are envisaged under this component:

(i) in-firm training tied to production practices and (ii) association-sponsored seminars, workshops and demonstrations of new technologies. There may be a need to recruit international trainers/engineers to deliver in-country training in both modalities.

For the test case proposed, six foreign trainers/engineers will be recruited by CANIECE to come to Mexico, in two month intervals, to work with selected CANIECE member companies to transfer technical know-how and experience in the production of smart sensors. Technicians and supervisors of the sponsoring Mexican companies, whose engineers and supervisors participated in the overseas training activity, will receive first priority for in-firm training in Mexico by international trainers, followed by other selected CANIECE member companies and according to partnering agreement specifications. CANIECE staff will assign priorities to member companies' requests for this type training assistance based on the ability of the companies to pay training fees and criteria noted in paragraph 3.6.

In addition to bringing foreign trainers to Mexico, the Mexican engineers that received training abroad under this project will be required to commit to disseminate knowledge obtained through their overseas training by: (i) conducting training sessions for engineers and technicians within the participating Mexican companies; (ii) agreeing to conduct seminars and training sessions before appropriate engineering professional societies in Mexico; and (iii) providing advice and additional training to Mexican engineers and technicians as requested from time-to-time by CANIECE. Each engineer or technician who has received training will be expected to be available at least eight hours per month for at least three years after receiving training to further disseminate the knowledge obtained during the training.

The third component will upgrade the existing structure now in place in the CANIECE Human Resources Department by providing technical assistance and staff resources to manage and guide training initiatives in the industry. In addition, the project will finance the following activities: (i) a needs assessment of the industry to identify specific manufacturing technologies eligible for CANIECE training fund support and to establish a registry of companies in Mexico and other leading competitor countries which could offer training in advanced manufacturing techniques (consulting firm, three man-months); (ii) development of productivity networks

(individual consultant, 3 man-months); and (iii) training of trainers (individual consultants, four man-months).

The expected results of the institutional strengthening component include: (i) establishment of criteria for selection of firms, participants, and trainers; (ii) dissemination of successful practices and the promotion of human resource development concepts among this industries key members; (iii) promotion of demand-oriented training through the implementation of mechanisms that facilitate collaboration between private sector enterprises; and (iv) promotion of an exchange of technology between Mexican based industries and their foreign partners.

FINANCING: Modality: Grant Facility II, HRD

Recipient: US\$800,000

MIF: US\$2,000,000

Total: US\$2,800,000

IMPLEMENTATION SCHEDULE: Execution period: three years

Disbursement period: 36 months, with the exception of an additional disbursement for the ex-post evaluation which would occur at 40 months.

ENVIRONMENTAL CLASSIFICATION: The Environmental Management Committee, at its meeting of August 15, 1995, classified this as a Category II operation.

VIABILITY: This project will develop, test, and evaluate an innovative, industry-specific methodology for the transfer and financing of advanced technical know-how. Its viability rests in the fact that the executing agency is well-equipped to implement the program: CANIECE has experience with training and human resources development as related to the industry; represents the majority of the firms in the sector; is in a position to exert leadership and pressure on its members to comply with the information dissemination requirements so as to ensure the multiplier effect of this training program, and has carried out sufficient research to understand the immediate training needs of the industry.

RISKS: Risks relate less to the institutional capacity, therefore, of CANIECE to implement this program and more to the absorptive capacity of the engineers both to absorb and to transfer their training abroad to the Mexican context. The financial situation in

Mexico is an undeniable risk which could inhibit firms from participating in this program and applying the knowledge of the trainees upon return due to lack of capital.

**SPECIAL
CONTRACTUAL
CONDITIONS:**

(a) As a condition prior to first disbursement of the financing, the executing agency shall present to the Bank's satisfaction a plan of action, detailed budget, and implementation schedule (paragraph 4.2).

(b) Other special contractual conditions are as follows: (i) criteria for disbursement of training funds and cost-recovery procedures will be developed by CANIECE and agreed to by the Bank six months after project start-up (paragraph 3.27); (ii) prior to disbursement for equipment purchase, CANIECE must present to the Bank equipment justification, feasibility analysis, and a reimbursement plan (paragraph 3.27); and (iii) requirements for project evaluation are set forth in paragraphs 9.1 through 9.3 and those for reporting are set forth in paragraph 3.29.

I. COUNTRY ELIGIBILITY

- 1.1 Country eligibility for Mexico was approved on January 23, 1994 by the Donors Committee based on a Memorandum of Country Eligibility prepared by the Bank.

II. BACKGROUND

- 2.1 Hard sought economic gains Mexico achieved over the past decade are disintegrating as the country grapples with financial crisis. The crisis has already had an impact on unemployment. Enterprises in the formal sector have been shedding labor to reduce costs and improve short-term cash flow. Between November 1994 and January 1995, according to IMSS statistics, 231,000 workers lost their jobs in the formal sector. Of these job losses, 36% were in manufacturing, 18% in commerce, 11% in construction. Despite these hardships, important segments of the manufacturing industry continue to strive to be internationally competitive and pay high costs to obtain ISO 9000 certification to compete for international contracts to supply goods and services.
- 2.2 Mexico continues to place a high priority on a skilled labor force as an essential ingredient for competition in world markets. Public investments in workforce development have been identified as an integral component of the government's recent request for emergency support from the IDB and the World Bank. US\$225.9 million of Program of Essential Social Services financing is devoted to increasing the targets of programs aimed at supporting worker retraining and providing matching grants to micro, small, and medium entrepreneurs seeking funds to provide in-service training to their workers.
- 2.3 Existing programs, however, are not equipped to support industries or firms seeking to incorporate cutting edge production technologies of their international competitors, which is referred to as "benchmarking." Some small high performance manufacturers in Mexico have made great strides in developing the best in-service training programs accessible in country but typically lack investment monies to access more highly specialized training, provided only in industrialized countries or attainable by partnering with leading competitors. Smaller firms lacking economies of scale to make this type of investment up-front, are beginning to seek support from their industry associations for external, specialized training requirements.
 - A. The electronics industry
- 2.4 According to data developed by Camara Nacional de la Industria Electronica (CANIECE) and by the Secretariat of Commerce and Industrial Promotion [Secretaria de Comercio y Fomento (SECOFI)], the electronics industry employed a total of 98,500 individuals in

1993, of whom 66,980 were classified as administrative, technical, or supervisory and 31,500 were classified as factory workers.

- 2.5 The total market size for electronic products in Mexico in 1993, excluding installation, operation, and maintenance of equipment and systems, was US\$4.9 billion for exports. Certain segments of the electronics industry have shown significant growth; for example, the computer industry, grew more than one hundred percent between 1988 and 1991. In general, industry growth has been approximately ten percent per year. However, the expected growth for the period 1995-2000 is 15 to 17%.
- 2.6 CANIECE is the principal private sector association representing the interests of the electronics and communications equipment industries in Mexico. CANIECE began operations in 1957 and currently has 641 affiliates that represent about 75% of all companies in the electronic sector in Mexico. Of these 641 companies, 85% are micro or small businesses (annual net sales less than US\$1.8 million); 10% are medium-size (annual sales less than US\$3.3 million) and 5% are large business (sales in excess of US\$3.3 million). The micro and small businesses are, for the most part, family-owned with primarily Mexican capital.
- 2.7 The 641 companies are located throughout Mexico but the largest number are in the states of Aguascalientes, Sinaloa, Puebla, Queretaro, San Luis Potosi, Sonora, Tamapulipas, Tlaxcala, and Vera Cruz. Cities with the larger concentration of CANIECE members are in the Federal District (Mexico City) and Guadalajara. CANIECE is organized into nine sections that represent the principal productive activities of the industry in Mexico. These sections range from household electronic equipment and appliances to electronic and telecommunications equipment systems.
- 2.8 Recent surveys conducted by CANIECE have identified the introduction of automated production technologies as being critical to further development of the industry in Mexico. This would involve the introduction of the following:
 - a. Surface mount technology (SMT) production methods;
 - b. Manufacture of semiconductor microchips and mounting of chips on ceramic wafers;
 - c. Manufacturing operations in a "cleanroom" environment;
 - d. use of numerically controlled machine tools; and
 - e. Advanced statistical quality control procedures.
- 2.9 This technology lends itself, in particular, to the development of smart sensors, that is sensors with built-in computer capabilities. The leading sensor manufactures in the world are in Japan and the United States. Sensors are essential components of both manual and automated production lines and thus an important building block for further industrial development in Mexico. Moreover, the type of automated production technology contemplated has wide application

in the manufacture of other electronics products and thus has important income and job creation consequences for the sector.

- 2.10 Over 25 CANIECE member companies, all of which are in the small- and medium-size scale, have the potential to absorb training in the manufacture of sensors. Financial analysis by management of prototype firms potentially eligible for this training program has shown that the companies cannot justify investment of the initial cost to pay for training outside Mexico and that amortization of the cost of this level of overseas training would make sensor products produced in Mexico non-competitive in world markets.

III. THE PROJECT

- 3.1 The proposed three year project is designed to assist the electronics industry in responding to the above-noted skill needs through specialized, enterprise-based training. Participating firms and workers will gain technical know-how, training, practical experience with state-of-the-art production methods, and access to new technologies in their area of specialization. The project will have the dual effect of involving employers in training program design to ensure that the training is tailored to meet industry needs. The project is intended to become a self-sustaining program to train manufacturing engineers and technicians from CANIECE member companies through the establishment of a revolving training fund. The training fund is a financial mechanism to recuperate costs of the overseas and in-country training sponsored by CANIECE.

A. Objectives

- 3.2 The overall objective of the project is to promote the competitiveness of strategic segments of the electronics industry, by testing innovative training and financing mechanisms that will allow member firms to introduce state of the art technologies in Mexico.
- 3.3 Specific objectives are to: (i) transfer technical know-how through external training and industry benchmarking in strategic technologies not available in Mexico; (ii) introduce specialized enterprise-based or association-sponsored training strategies for engineers, technicians and other industry workers; (iii) strengthen the institutional capacity of CANIECE to manage and sustain the training program; and (iv) test the effectiveness of the pilot training and financing mechanisms.
- 3.4 To achieve its objectives the project will consist of three components: transfer of international know-how and industry benchmarking, specialized enterprise-based training, and institution-building and training promotion.

B. Project components

1. Transfer of international know-how and industry benchmarking

- 3.5 This component will support participant access to highly specialized training and technologies not available in Mexico. The project will develop a test case to examine the design of the proposed training mechanism. The training activity for the test case will involve sending engineers and technicians from selected Mexican firms abroad for an estimated 12 months to gain knowledge and experience necessary to manage automated production.
- 3.6 The training activity specifically will involve the transfer of technical know-how to manage the manufacture of smart sensors. This test case has been identified based on the survey CANIECE conducted (paragraph 2.8) and on discussions the Association has had with several of its members that presently have the capability to design and manage manual assembly of certain simple models of sensors. Over a three year period, it is anticipated that 12 engineers and/or technicians will need to receive training in the test case to achieve the desired transfer of technology and impact. In the first year of project implementation, four engineers and/or technicians are to receive training in Japan, given that a partnering arrangement has already been established between a Mexican company and a Japanese sensor manufacturer. Additional partnering arrangements with international sensor producing firms will be identified by CANIECE during the first year of project execution for the remaining eight engineers and/or technicians included in the test case.
- 3.7 The specific objectives of training proposed in the test case are to: (i) upgrade and expand the skills and knowledge of Mexican engineers in microchip assembly, surface mount technology, numerically controlled machining, quality control, and other related areas; (ii) provide participants with the necessary knowledge and skills needed to adapt to technological innovation and new work processes as these are introduced into the workplace; and (iii) increase the engineers' ability to contribute to the productivity of the enterprise where they function.
- 3.8 CANIECE will poll member companies to determine their interest in participating in the training project. CANIECE management will evaluate candidate companies based on the following criteria: (i) potential for growth and transferability the introduction of the proposed technology presents for the industry and the capacity and readiness of CANIECE members to absorb the technology; (ii) commitment of the foreign company to enter into a training partnership agreement with the Mexican candidate firm and CANIECE that outlines the types of training and benchmarking activities that would be provided; (iii) capacity of the Mexican company to meet its obligations to reimburse CANIECE for training funds received and to fulfill its obligation to disseminate knowledge and experience gained abroad to member companies according to

agreements defined by CANIECE; and (iv) that engineers, technicians, or supervisors of the companies identified for external training have the skills and experience required, including aptitude to work overseas and where necessary, foreign language skills.

- 3.9 The training program for engineers, production supervisors, and trainers at sites outside of Mexico, in this pilot exercise and in future training programs managed by CANIECE, will be custom designed to correspond to the particular needs of the individuals being trained and the requirements of the Mexican companies that sponsor these individuals. Course content and design will be suggested by the cooperating company in the foreign country, will be reviewed by the Mexican sponsor company and will be approved by CANIECE human resources staff. The activities CANIECE agrees to fund would be detailed in formal agreements CANIECE signs with beneficiary member firms.
- 3.10 Generally, each customized training program will include the following characteristics: (i) the duration of the training abroad will be between six and twelve months; (ii) training will be provided in-plant; (iii) training will include instruction by engineers, or other pre-identified specialists, at the cooperating companies concerning the engineering principles, capabilities, and limitations of high-technology production equipment; and (iv) hands-on experience in the design facilities and plants of the cooperating companies where the state of the art technologies are utilized and where trainees can learn to design production lines and the intricacies of their operation.

2. Specialized enterprise-based training

- 3.11 This component will finance in-country training to support the introduction of specialized technologies not available in Mexico. Two types of modalities are envisaged under this component: (i) in-firm training tied to production practices and (ii) association-sponsored seminars, workshops and demonstrations of new technologies. International trainers/engineers will be recruited as necessary to deliver in-country training.
- 3.12 For the test case proposed, six foreign trainers/engineers will be recruited by CANIECE to come to Mexico, in two month intervals, to work with selected CANIECE member companies to transfer technical know-how and experience in the production of smart sensors. Technicians and supervisors of the sponsoring Mexican companies, whose engineers and supervisors participated in the overseas training activity, will receive first priority for in-firm training in Mexico by international trainers, followed by other selected CANIECE member companies and according to partnering agreement specifications. CANIECE staff will assign priorities to member companies' requests for this type training assistance based on the ability of the companies to pay training fees and criteria noted in paragraph 3.8.

- 3.13 For this pilot training program and for future training programs, each company, whose employees are to receive training in Mexico, will be asked to prepare a brief Training Protocol, satisfactory to CANIECE Human Resources staff, that includes (i) the companies specific objectives for the training; (ii) availability of appropriate equipment and facilities at the recipient companies; (iii) probable duration of training; (iv) number and qualification of individuals to be trained; (v) methods by which individuals to be trained will, in turn, further disseminate this training to other company employees; and (vi) total number of workers in the company that will benefit from training.
- 3.14 Training provided by foreign country engineers/specialists in Mexico will include, but will not be limited to: (i) formal lectures and demonstrations for Mexican engineers and technicians at CANIECE or other appropriate sites where demonstration equipment is available; (ii) on-the-job supervision of Mexican engineers to correct and improve their job performance; (iii) assistance to Mexican engineers to understand and interpret manufacturing drawings and process control procedures, and quality control methods; and (iv) one-on-one discussions with Mexican engineers to clarify production techniques.
- 3.15 In addition to bringing foreign trainers to Mexico, the Mexican engineers that received training abroad under this project will be required to commit to disseminate knowledge obtained through their overseas training by: (i) conducting training sessions for engineers and technicians within the participating Mexican companies; (ii) agreeing to conduct seminars and training sessions before appropriate engineering professional societies in Mexico; and (iii) providing advice and additional training to Mexican engineers and technicians as requested from time-to-time by CANIECE. Each engineer or technician who has received training will be expected to be available at least eight hours per month for at least three years after receiving training to further disseminate the knowledge obtained during the training.
- 3.16 The project may require certain advanced technology manufacturing and quality control equipments for the pilot training activity. Funds are earmarked for the purchase of precision measuring equipment for use in quality control; certain placement and positioning equipments for use in surface mount applications; and other equipments. Technical assistance will be provided to CANIECE to determine the justification and analyze the feasibility of the equipment request and to develop a reimbursement criteria related to the test case. Prior to disbursement for equipment purchase, CANIECE must present to the Bank justification, feasibility analysis, and the reimbursement plan of the equipment request.

3. Institution building and training promotion

- 3.17 This component will upgrade the existing structure now in place in the CANIECE Human Resources Department by providing technical

assistance and staff resources to manage and guide training initiatives in the industry. In addition, the project will finance the following activities: (i) a needs assessment of the industry to identify specific manufacturing technologies eligible for CANIECE training fund support and to establish a registry of companies in Mexico and other leading competitor countries which could offer training in advanced manufacturing techniques (consulting firm, three man-months); (ii) development of productivity networks (individual consultant, 3 man-months); and (iii) training of trainers (individual consultants, four man-months).

- 3.18 The Human Resources Department of CANIECE currently maintains a general inventory of professional and technical skills required by the electronics industry in Mexico. This inventory will provide a basis for project staff in developing a strategic paper for the consideration of the CANIECE Board and the Bank. The strategy paper will identify training priorities and criteria to guide project investments and help establish procedures for on-going analysis to shape future revolving training fund activities.
- 3.19 To develop the strategy paper the CANIECE Human Resources Department will conduct a series of working groups, which key manufacturing executives in the electronics industry will be invited to attend. The purpose of these working groups will be to assign an order of priority for manufacturing technologies that should be the subject of training. The findings of the working groups and a draft of the strategy paper will be circulated to CANIECE members for comment. The Human Resources Department, as part of this needs assessment exercise, will retain consulting services of a firm, selected according to Bank procedures, to develop the registry of companies capable of offering training in advanced manufacturing techniques and to conduct and analyze the results of the working groups.
- 3.20 CANIECE Human Resources staff will work with CANIECE member companies to develop productivity networks both within individual companies and between Mexican companies that use similar or related manufacturing technologies. The framework for these networks will be a "who knows what" skills inventory, with individuals' names, telephone numbers, and area of production expertise, that CANIECE will develop and maintain. The nucleus of names for this skills inventory will be the staff trained outside of Mexico under the first component of this project. This nucleus will be expanded to include engineers, production supervisors, and quality control specialists, who in turn, receive training through the second component of the project and also who have received relevant training from other sources. CANIECE Human Resources staff will work with human resources personnel in member companies to further the understanding that cooperative development of a pool of highly trained production personnel has the potential to benefit all companies in the Mexican electronics industry.

- 3.21 CANIECE Human Resources staff will also develop and maintain a roster of engineers and technicians that have received training in donor countries with details of the special knowledge acquired during their training and information about their current employment. Based on CANIECE's electronics industry needs assessment data, CANIECE Human Resources staff, with the assistance of training consultants will develop a program of seminars and two to three week continuing education short courses that will be taught by these engineers and technicians and open to staff from all Mexican electronics companies.
- 3.22 The expected results of this component include: (i) establishment of criteria for selection of firms, participants, and trainers; (ii) dissemination of successful practices and the promotion of human resource development concepts among this industry's key members; (iii) promotion of demand-oriented training through the implementation of mechanisms that facilitate collaboration between private sector enterprises; and (iv) promotion of an exchange of technology between Mexican based industries and their foreign partners.

C. Beneficiaries

- 3.23 This project is designed to improve the engineering and production knowledge of an ever-widening network of small- and medium-sized Mexican firms engaged in cutting-edge technologies. Initially the project proposes to train a small cadre of engineers abroad in automated production of electronics products. These engineers will transfer their knowledge to approximately 60 engineers, technicians, and production supervisors in Mexico with assistance from foreign country engineers that visit Mexico in connection with this project. These 60 Mexican trainees, in turn, will become training specialists, who will impart specific manufacturing know-how to approximately 600 production workers that they supervise.

D. Executing mechanisms

- 3.24 This project will be executed by CANIECE over a three year period for the initial training envisaged. However, the transfer of technology and related training are to occur in stages. Therefore not all results will be available in the 36 month project duration. An ex-post evaluation will occur six months after completion of all training activities financed through the second year of the project.
- 3.25 The project will be executed by CANIECE's Human Resources staff. CANIECE periodically develops and conducts continuing education courses and seminars for managers, engineers, and technicians in the electronics industry. The offices of CANIECE include classrooms and meeting rooms and CANIECE staff regularly organize technical meetings and related events. These facilities will be used for all project training activities that do not require in-plant observations or practices.

- 3.26 The Chief Executive Officer of CANIECE is an elected President who serves for a one-year term and who may be re-elected for an additional one-year term. The President of CANIECE is also an active executive of a commercial company in the Mexican electronics industry. The President is advised by a counsel of administration consisting of nine Section Presidents (Presidente de Seccion), each of whom is also an executive of a Mexican electronics company and each of whom represents one of the major segments of the Mexican electronics industry. The CEO and counsel will provide overall policy direction to the project. Day-to-day operations of CANIECE are managed by a General Manager (Gerente General), who is a full-time employee of CANIECE and who manages a full-time staff of 35 to 40 individuals.
- 3.27 The Human Resources Department (HRD) which is managed by a full-time professional who will operate as the technical unit of the project. CANIECE will recruit and employ two additional staff members in the HRD that will be responsible for coordinating the implementation of the project: a Project Facilitator and a Training Specialist. Both individuals will report to the Manager of the Department. 50% of the salaries of these positions will be paid by CANIECE: Both positions will become permanent staff jobs after 24 months of project implementation, at which point CANIECE will finance 100% of the payroll costs. All facilities and administrative support required by these staff will be provided by CANIECE.
- 3.28 For the sustainability of the project, CANIECE will establish a revolving training fund to recover the costs of the training. Three types of costs are envisaged in the fund: (i) loans to member companies to finance overseas training that will be reimbursed at a rate of 30% in the first two years of project implementation and the balance over a longer period; (ii) in-country training fees that will be based on market rates; and (iii) cost reimbursement for other categories of service. Criteria for the disbursement of training funds and cost-recovery procedures will be developed by CANIECE and agreed to by the Bank six months after project start-up.
- 3.29 With respect to this project the HRD will be responsible for the following activities: surveying training needs among its member companies, establishing selection criteria for training, coordinating the participation of the Mexican companies whose employees receive training, monitoring training, reviewing additional requests for future training, managing the revolving training fund, negotiating detailed agreements with each company recipient concerning terms and conditions for the use of these funds, making project disbursements, and preparing financial reports.
- 3.30 CANIECE will contract specialized consultants, within the first two months of project execution, to develop the monitoring and evaluation indicators which will be collected throughout project

execution. Monitoring will be done in conjunction with the Bank's standard reporting requirements and will include basic information on the participant training and specific activity benchmarks of the project. The basic supervision of this project will be the responsibility of the Bank's Country Office in Mexico, which will review the reports of the HRD Manager, quarterly implementation schedules in relation to budget allocations and project goals, the mid-term assessment and ex-post evaluation of the project.

E. Project cost, source of financing, and cost recovery

- 3.31 The total cost of the project is estimated to be US\$2,800,000, US\$2,000,000 of which will be provided by MIF through non-reimbursable financing and US\$ 800,000 will be provided by CANIECE through in-kind and cash contributions. US\$400,000 of the CANIECE contribution is attributed to in-country training. The Association will charge competitive rates for seminars and training demonstrations over the three year implementation period. The balance of the CANIECE contribution will cover the following project administrative costs: facilities for certain types of training activities, project offices, support personnel, and 50% of project staff salaries in the first two years of implementation and 100% of staff salaries in the third year of implementation.
- 3.32 In addition to the Association's contributions noted above, firms and individuals that receive training abroad or in-country will reimburse CANIECE for these services over an agreed period and according to competitive fee schedules, respectively. Monies received from these training activities will go into the revolving training fund to sustain additional advanced manufacturing training activities. Three types of cost-recovery strategies are envisaged to sustain the revolving training fund that will be managed by CANIECE: (i) loans to member companies to finance overseas training that will be reimbursed at a rate of 30% in the first two years of project implementation and the balance over a longer period; (ii) in-country training fees that will be based on market rates; and (iii) cost reimbursement for other categories of services.

TENTATIVE DETAILED BUDGET
(US\$ Dollars)

	MIF	LOCAL	TOTAL
1. Consulting firms			
- Needs Assessment/Registry	30,000	--	30,000
Subtotal	30,000	--	30,000
2. Individual consultants			
- Productivity network	15,000	--	15,000
- Training Program Design	26,000	--	26,000
- Equipment specialist	40,000		40,000
Subtotal	81,000	--	81,000
3. Training (scholarships/fellowships)			
- Outside Mexico	501,600	144,000	645,600
- In-Country	412,800	400,000	812,800
Subtotal	914,400	844,000	1,758,400
5. Travel on official business	15,600	--	15,600
Subtotal	15,600	--	15,600
6. General support			
6.1 Premises	--	80,000	80,000
6.3 Equipment			
- Measuring equipment	84,000	64,000	148,000
- Positioning equipment	128,000	--	128,000
- Other equipments	288,000	--	288,000
6.4.1 Teaching materials	57,000	--	57,000
6.6 Support personnel	--	36,000	36,000
Subtotal	557,000	180,000	737,000
7. Publications	30,000	4,000	34,000
Subtotal	30,000	4,000	34,000
8. Project staff			
- Project facilitator	36,000	36,000	54,000
- Training specialist	36,000	36,000	54,000
Subtotal	72,000	72,000	144,000
97. Special programs			
- Evaluation	100,000	--	100,000
Subtotal	100,000	--	100,000
98. Contingencies (10%)	200,000	--	200,000
TOTAL	2,000,000	800,000	2,800,000

IV. DISBURSEMENTS

- 4.1 Disbursements for the operation would be made in accordance with Bank procedures. The Bank may authorize changes in any of the components provided that they do not affect the basic objectives of the overall program.
- 4.2 As a condition prior to first disbursement, CANIECE will present evidence of a plan of action, including a detailed budget, and implementation schedule.

V. VIABILITY AND RISKS

A. Viability

- 5.1 This project will develop, test, and evaluate an innovative, industry-specific methodology for the transfer and financing of advanced technical know-how. Its viability rests in the fact that the executing agency is well-equipped to implement the program: CANIECE has experience with training and human resources development as related to the industry; represents the majority of the firms in the sector; is in a position to exert leadership and pressure on its members to comply with the information dissemination requirements so as to ensure the multiplier effect of this training program, and has carried out sufficient research to understand the immediate training needs of the industry.

B. Risks

- 5.2 Risks relate less to the institutional capacity, therefore, of CANIECE to implement this program and more to the absorptive capacity of the engineers both to absorb and to transfer their training abroad to the Mexican context. The financial situation in Mexico is an undeniable risk which could inhibit firms from participating in this program and applying the knowledge of the trainees upon return due to lack of capital.

VI. COMPLIANCE WITH PROJECT ELIGIBILITY CRITERIA

A. General criteria for project eligibility

- 6.1 The proposed project is consistent with the general purpose of the MIF approved in the Agreement establishing MIF as stated in Article I, (b) referring to the generation of increasing levels of private sector participation and of employment opportunities.

B. Facility criteria for project eligibility

- 6.2 The project is also fully consistent with the criteria for grant financing under the Human Resources Facility of the MIF Agreement which establishes, among other criteria, that grants be provided to strengthen training capacity and develop the skills of the workforce.

VII. COMPATIBILITY WITH THE BANK'S COUNTRY PROGRAM

- 7.1 The current strategy for Mexico (1995-1997) calls for activities and programs focused on stimulation of the private sector and productive employment, along with a more efficient public sector and better allocation of resources. Priority areas of Bank support

include programs of education and training (formal and non-formal) to strengthen the human resource base of the country and to better address the emerging needs of the labor market through greater participation by the private sector. The project proposes to improve the quality and accessibility of technical training and to encourage private sector participation in technical training, and therefore, is complementary and coherent with the Bank's 1995-1997 operating program in Mexico.

VIII. AVAILABILITY OF MIF RESOURCES

- 8.1 The project is expected to be financed through a grant based on the following points: (i) Mexico's eligibility which was received on January 23, 1994; (ii) Mexico's compliance with the criteria of eligibility for obtaining grant resources at the country level (Article III, Section 5(b) of the MIF Agreement) detailed in Section III paragraphs 3.1-3.4 of the Eligibility Memorandum for each country; and (iii) the catalytic impact the proposed project is expected to have on investment flows, as required under Article III, Section 5(a) by facilitating increased productivity in the small- and medium-scale industry sector in Mexico.

IX. MONITORING AND EVALUATION

- 9.1 The Bank, with the concurrence of CANIECE, will recruit specialized consultants to conduct two evaluations of the project, a mid-term and ex-post.
- 9.2 Specifically, the scope of the evaluations will include, but not be limited to: (i) what are the significant project milestones and have these milestones been achieved; (ii) has the project had an impact on the productive capability of participating companies; (iii) have other Mexican companies received any benefit from the project; (iv) identification of linkages to export-oriented sectors; (v) what are the appropriate measures of effectiveness for the project and what are relationships between these measures and project costs; (vi) has there been an appropriate in-flow of funds to the revolving training fund; (vii) how have the Human Resources capabilities of CANIECE changed as a result of this project; and (viii) what lessons can be learned from this project that may apply to its continuation in Mexico or that can be applied to similar projects in other countries.
- 9.3 Two evaluation reports will be issued. The first will occur midway after project implementation begins (18 months). This interim review will allow the Bank to identify any problems with project execution and modify the project as needed. An ex-post evaluation will occur six months after completion of all training activities financed through the second year of the project and will assess the mid-term effect of the program of the industry as a whole.

PROPOSED RESOLUTION

MEXICO. NONREIMBURSABLE TECHNICAL COOPERATION FOR
TECHNICAL TRAINING IN THE ELECTRONICS INDUSTRY

The Donors Committee of the Multilateral Investment Fund

RESOLVES:

1. That the President of the Inter-American Development Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Multilateral Investment Fund, to enter into such agreements as may be necessary with the Estados Unidos Mexicanos and to take such additional measures as may be pertinent for the execution of the project memorandum referred to in Document MIF/AT- with respect to a program of technical cooperation for technical training in the electronics industry.

2. That up to the amount of US\$2,000,000, or its equivalent, is authorized for the purpose of this resolution, chargeable to the resources of the Human Resources Facility of the Multilateral Investment Fund.

3. That the above-mentioned sum is to be provided on a nonreimbursable basis.